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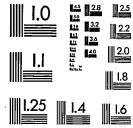

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Thomas A. Edison Papers

A SELECTIVE MICROFILM EDITION

PART IV
(1899–1910)

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Rutgers, The State University
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Notebook, N-02-03-18

This notebook was used during March 1902. All entries are by Edison. The book contains notes and drawings regarding several experiments that deal mainly with electricity and electromagnetic radiation. Among the entries are items pertaining to the use of phosphorescent materials with a "disc kinetoscope," etheric force and "xyz rays," fluorescent lighting, thermocouples, liquid organic storage batteries, and phonograph recording and reproduction using electromotograph apparatus. The book contains 280 numbered pages. Some pages are blank; pages 3-4 have been removed from the book.

No. Desk Kinetoscope — Tag

March 18 1902

16 inches — 48 dia — ¼ apart,
8 rows of pictures, mean length,
42 inches

$$\begin{array}{r} 42 \\ \times\ 8 \\ \hline 12)\ 336\ (28\text{ ft} \\ 24 \\ \hline 96 \\ 96 \\ \hline 0 \end{array}$$

Desk glass or a frame with but few spokes + celluloid film pasted over —

Instead of Coarse grain gelatine use fine grain opaloids or tintype stock,

Possibly pure collodion involuntarily incorporated a phosphorescent chemical when dry the best "Canton phosphorescent" this Coating long enough to print from the phosphorescent light?

36
48
84

No 4020
ARTHUR
MANUFACTU
BY CEDARS
NEW YO

Kinetes —

The disk to be illuminated by gases at Edge —

possibly Balsamic Gummy paint in Collodion of ground fine would answer or - Oxalate of Lithia + pin hole Lenses or Quinly Lenses + arc light would possibly in experiments with the 17000 Crystals will strike something good —

Even Mica could be used put in segments the cracks arranged with fine so they come between each picture — If negative taken by phosphorescent material, digital type or the paint could be used which having no grain would be a better ~~[illegible]~~ than a + 1/4" picture would be better than Reg 1" 1000 — when projected —

I think the best phosphorescent would be one dissolved in water or Angl alc with Collodion + then

Collodion would cause the
Crystals to be infinitely fine
hence fine lines & points of
phosphorescing crystals obtained
from this principle would
be more sensitive than the best
gelatine Silver Emulsion
& yet an neg film instead
of Neg Gel Emulsion positive
could be obtained from these
~~neg~~ with old collodion process
and Emulsion & thus in the form
gives a neg from which prints
could be made
The phosphorescence would not
last long enough to print
many

Try preliminary Experiments to
with pin hole Camera + Elec
arc light with phosphorescent
Salts on ~~Collodion~~ Collodion
on glass —

If it were possibly to obtain
phosphorescing Chemicals
that would phos 1 for
red 1 for green 1 for blue
it would make Colored
photography a success —
Try among the rare —

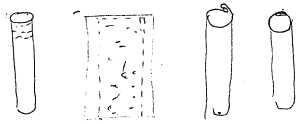
The phosphorescing material
might be mixed with the
Emulsion of gel + Ag Cl Br
+ put itself

possibly a steel band coated with Collodion & containing a phosphorescing sub could be put in a Kinetographe then pass into another Kinetogh working slowly & print from it before the crystals lost much of their power.

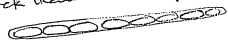
possibly the phos sub should be mixed with lampblack in such proportion that each crystal was surrounded on all sides by lampblack

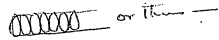
What's the matter with
Battery steel Cup stock as a
band with perforations for
feed + transparent collodion
or gelatine + blue print or
tintype film on it, the steel be
painted the picture could be
given by reflection supposing
for a Mutoscope slide or
Kinetic — it could even
be silvered + buffed or
gelatine print on a steel
band would be very cheap
+ lasting =

Storage Battery Mch 18/32



form tube of perf'd metal bars outside
mould briquettes in form of Cylinder
insert + then press out to form
closed ends + then
pack them in a Cup




or thus

Battery Mch 18 1902

Make a battery cell by forming a Zinc Mould pour zinc in & then Empty leaving a shell of Zinc like they pour Zn electrolytically then plate Ni over this very slight then Iron, then forming a seamless cell – afterwards it is heated to yellow to look Ni to Fe or possibly peened or pressed to consolidate the Fe –

A better way perhaps would be to use fusible metal bottle & dip a mandril shape of cell, have this Cold & dip in molten metal to Chill a surface on – then draw it to shape & use this as basis to plate on

Bathing Mch 15 1902

My impression is that internal pounds would be best as the metal would be smooth & ready to plate on right away — Could chill it away from mould or have mould split —

After plating, the base could be got out possibly by chilling. But probably have to melt it out, possibly type metal might answer but check not as it expands on solidifying —

It would be possible to draw lead to shape of cell & plate over it detaching

head afterwards

It would also be possible to make a large room with nitrogen only O being put out & in here, make cells ~~[illegible]~~ welding the rooms together, The man could wear an air-tight apparatus with tube leading outside of room

~~Think~~ Make some cells eg. way without solder of plate heavy with metal then heat to yellow –

fusible metal Expands on solidifying, its used for taking Casts, therefore better use a non metal matrix for cells or plaster powder Etc

Make some precipitated fluorides, & then bring them up to red heat or below Melting Point in Crucible, for phosphorescence — also try if dried will phosphoresce without the heating, I got this idea from action of precipitated Calcium phosphate which is OK for X ray after red heat

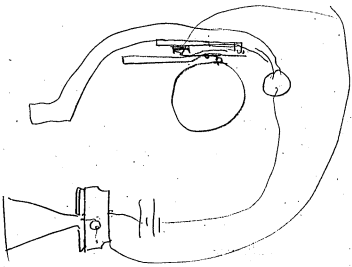
Try making Crystals Ca
by fusing precipd Ca WO_3
in other salts than ClK $ClNa$ —
possibly there will be a
great difference,

I think there may be lots
of precipitates of chem
that can be pressed to
tough Cakes by hydraulic
pressure, say neutral precipitates
Sleeves of metals,
insoluble phosphates Borates
fluorides, Sulphates Oxalates
that are gelatinous —
or amorphous —

Is it possible that very fine dried Chloride Sodium Could be pressed in Incomposement plate by Hydraulic pressure —

Make a List of Substances by fusion for fluorescing —
alloys with Cyanides of K
fluoride of Ca, other fluorides, phosphate Ca
sodium phosphate
Sulphide Ca & other Sulfides of metals, Zn etc —
Various proportions,

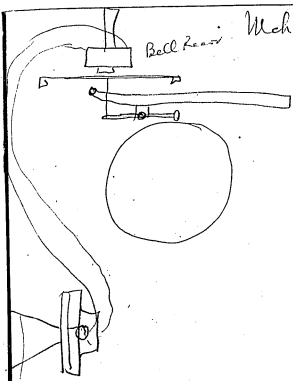
Phonograph – March 21 1902



Motograph run by phonograph –
Carbon button instead of diaphragm
Reproducer thru Chalk telephone

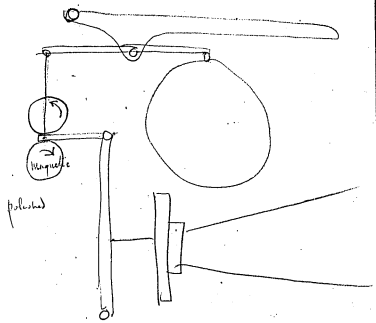
Bell Reed

Mchzl 1902

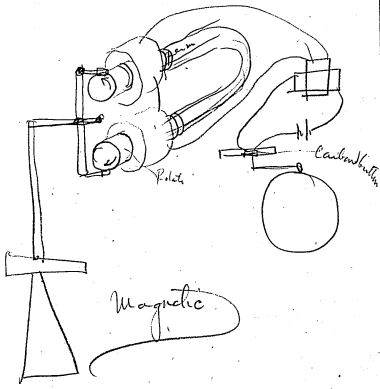


March 21 1902

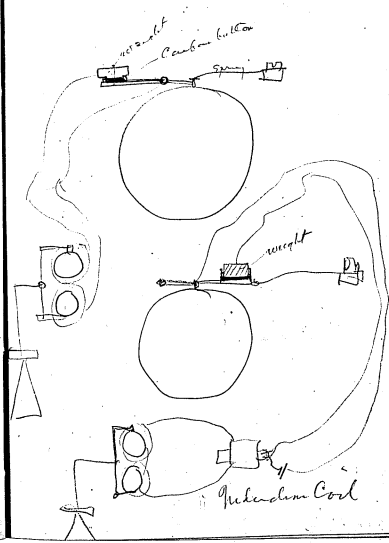
Phono

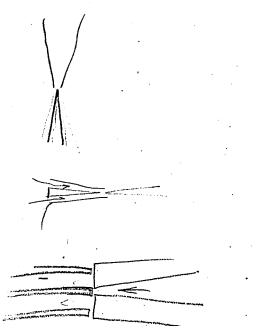


March 11 1902 Ghana



Mch 21 1902





Sand blast surface & then slightly buff it — Wood-shoe or Vulcanized fibre collar and file,

Wood March 21. 1902 Phono

The Pa Coefficient
should be determined as
used in which the tongue is present

Phonograph Surface
or a diagram showing

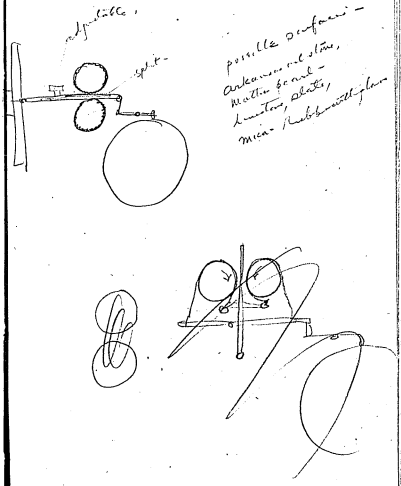
the pressure
per sq. inch
which is then measured by
Rolling on a 200 Scale with
a pressure gauge that will
give you 1/2000 of
an inch

Large Dia

Pa be Dyer send for Copy
of the Lidon Phono also
of the references in the Case
Especially the English
Case

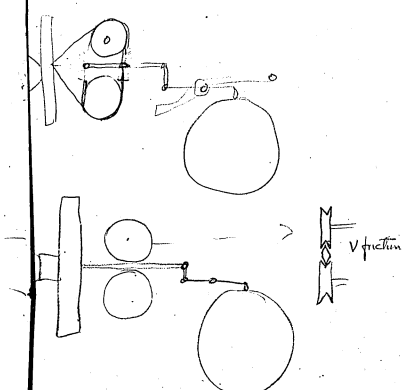
Possibly Cylinder of an alloy East out
with and one ingredient + buff

Mch 21 1902 Phmo

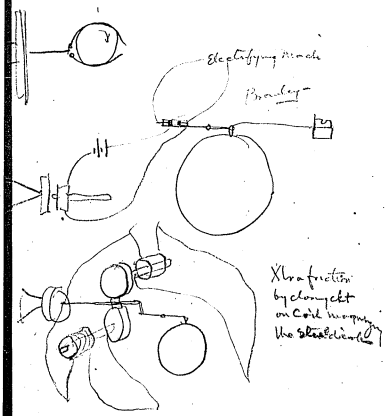


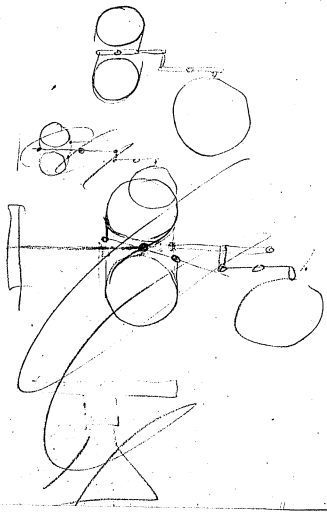
P Phoenix

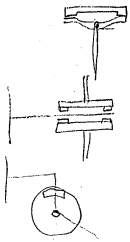
March 21 1902



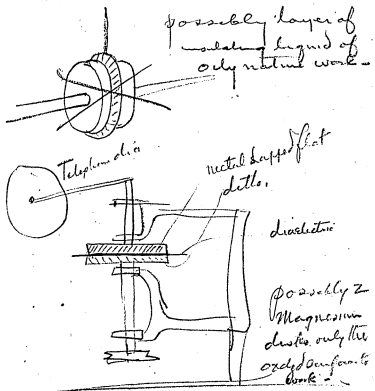
March 21 1902 P Phang



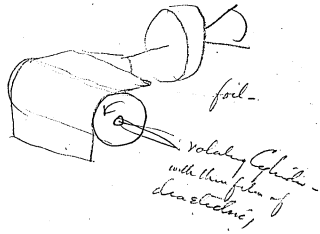


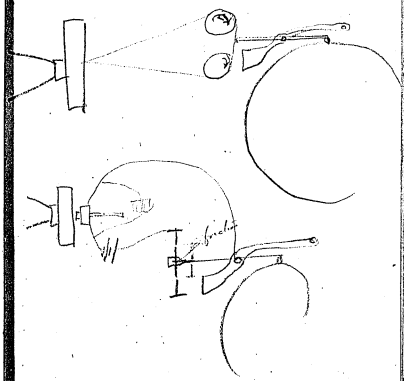


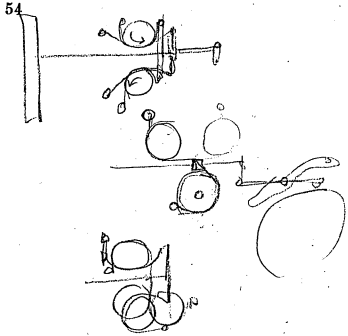
X42 =



possibly two lapped metallic surfaces of dif metals perfectly clean when rotated might hum when a current passed. possibly hum on P+ let go on negative — good. Expt.

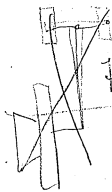

foil.
volume Cylinder
with thin film of
diamagnetic


brick

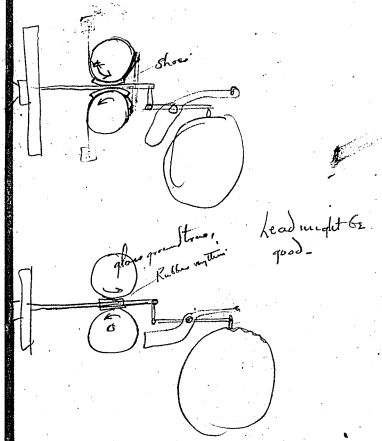


Dyer, furnish bound all phono patents to date.

also all English, French & German



March 21 1902 P Phaneuf



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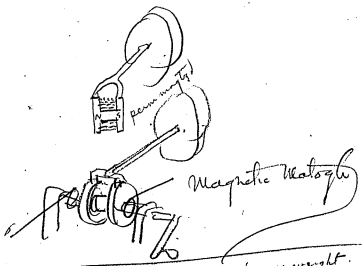
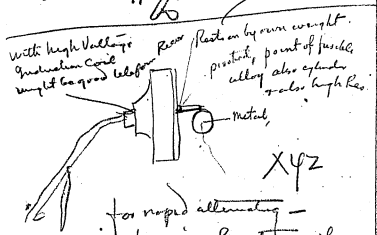
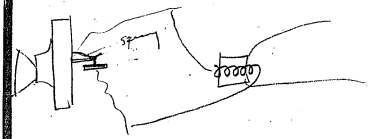


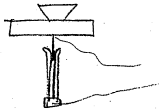


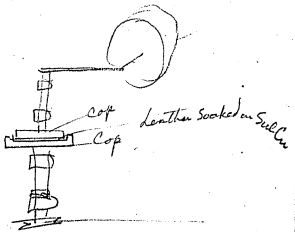
for rapid alternating —
freezing - Resistance of alloys should be very high at point to make high resistance.

possibly telephone could be made by rubbing on bad conductors.



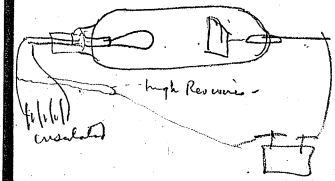
perhaps two highest Volt thermo alloys rubbing together & very low res primary of induction coil work well —





Brainley in a Vacuum —

X ray from a filament pole heated to high measurements,



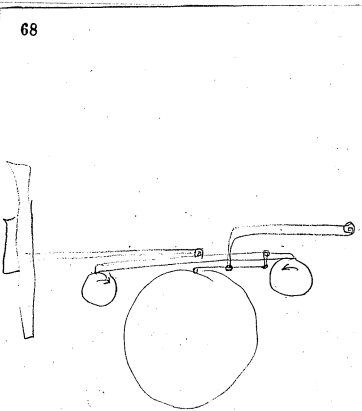
glow lamp by Oxdtn.

Vac pump —

fill 3/4 full with a mixture of Zinc dust + CuO — mixed dry about 2 or 3 grammes, get a Vaccum ~~heating~~ slowly after Vac obtained & finally more heat till it glows from Oxidation = possibly Fe by H will do = if any results by peroxide, also Manganese or Fe by Hydrogen — also Magnesium powder + ~~[illegible]~~ also ferric ox from ignited oxalate —

Pass glow discharge thro Coly gas on its way to a burner bee of it enriches it -

Will a soap bubble made from thick soap + glycerin mixed with precipitated Magnetic Oxide, go up + follow the lines of force also go towards a Magnet in the room —



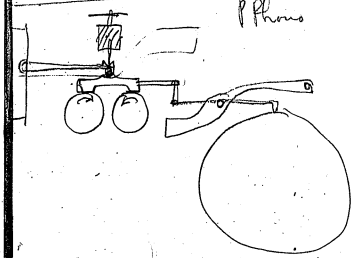
Mch 22 1902

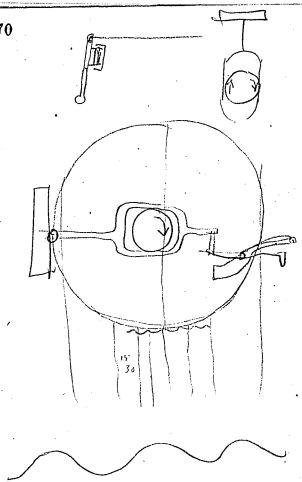
Andalusia

put in powdered tremolite
10 mesh phosphorescent
Materials for
fluorescent lamp &c

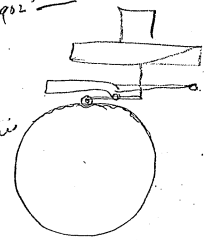
Natural point of Vera with
small sparking Coil -

P Phono



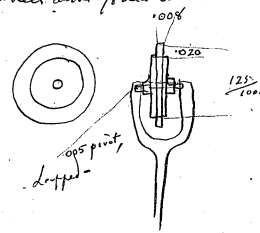


Mch 22 1902 Thurs

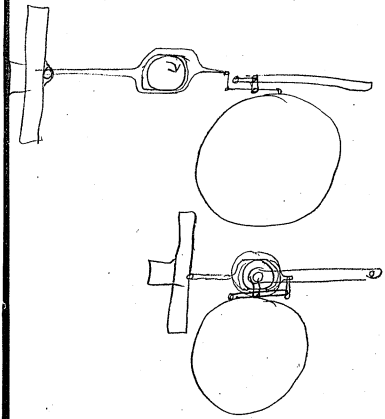


See what this does

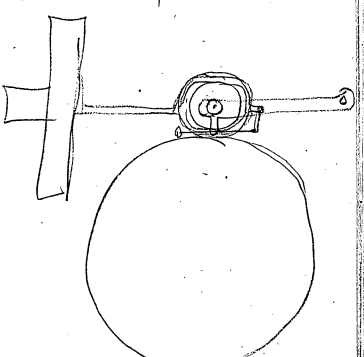
soft Rubber wheel about 1/8 dia with reduce



March 22 1902 P P Rhino -



March 22 1902 P Phono - 75

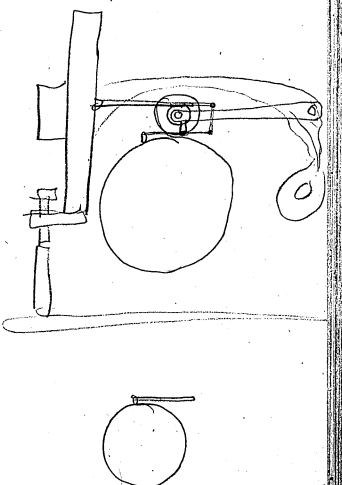


90 lbs

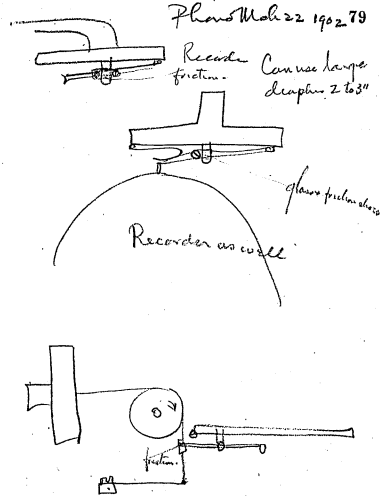
125 | 146 C
750

2600

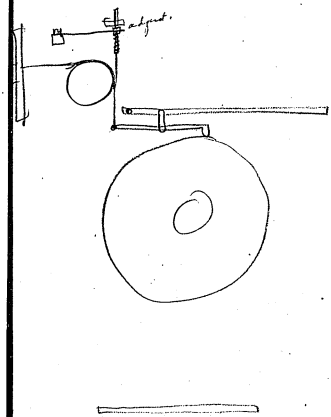
20600
5 | 3
24

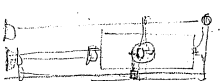


Phono Mob 22 1902 79



Mch 22 1902 P Phono





Arsenate of Copper sensitive to Light — Arsenic dissolves in NH_3 to the resulting Crystals that are sensitive, they contain NH_3.

to what is saturated sol of NaCl add $AgNO_3$ aq — a double salt forms which crystalizes in Cubes just like the salt. These crystals blacken in light. Make about 20 kinds with various proportion of AgCl — X ray phosphorescence of XYZ —

Sulphides of metals as a rule can be fused in all proportions with metals, Hence in Chemo Experiments make a lot of alloys with Sulphides as one of the ingredients, Iron Sulphides, Molybdenum Sulphides, Iodides, Antimonides, etc

Also, add monochl Cu to boiling sat
sol of NaCl in various proportions
& crystalize for X plus & XYZ

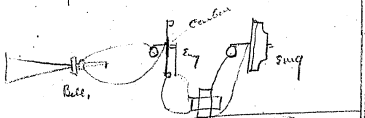
ditto Recently precip. Tungstic acid

also oxalate Lithia,
Chl Gold
" Iron
" Platinum,
" Uranium
Nitrate Uranium
All with Salt.

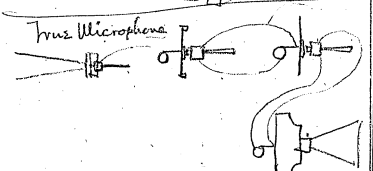
Make list out & try all the alkali salts
in 20 proportions each with
salt, put out maximum
dissolved & divide this in
20 parts —
try Chloride Iodide, ~~[illegible]~~
& all other salts ~~[illegible]~~
As the faintest trace of agel
in the salt crystalized on the

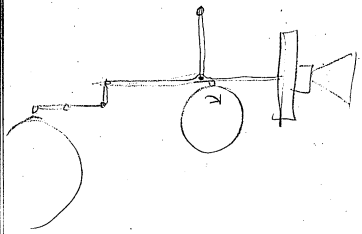
dark gauze fluorescence ~~of phos~~
with X ray its possible an
alloy will be found of great
~~Sensitiveness~~ —

for deaf —

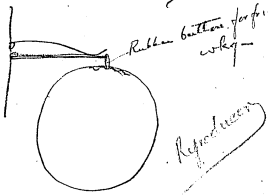


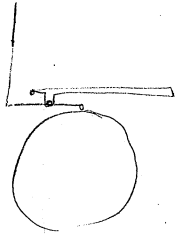
True Microphone



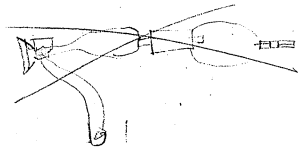


March 22 1902 Thurs





Try one of Wurlitz Metallic records with ~~[illegible]~~ plumbago ball or button, end of pencil & a telephone & battery, the speed & rise & fall of carbonat lever changes pressure & may be perfect reproduction



For making Sulphide alloys for Thermo, take large quantity of gray Lead, melt it & put in a weighted quantity of Sulphur then pour out a batch, then add another quantity of Sulphur & pour out some too on —
Each batch can be used to form the 20 series alloys with metals & others, Phosphides, Arsenides, Selenides, Tellurides, Antimonides

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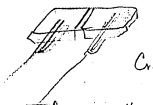
Will Nitrides work in an alloy? also ~~Cyanid~~ Cyano-nitrides

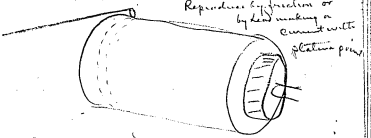
---

No 9



Crystal of Tourmaline -
plated over + then metal removed at
middle - two gaol, connected with
Clips to Galv + crystal heated
No Current

Cylinder of gray platinum powder - soaked
in salts lead - Telephone & Water Coil,
lead deposited on N + acid or mechanical -
Reproducer by friction or
by lead making a
current with
platinum pins



Cylinder turned smooth by Graphite -
+ heated after moulding.
Possibly bichloride Magnesia

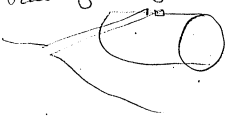
for coating to cylinders for
Chem recording - try glue
glycerine + the chemicals to be
used, coat cylinder hot I think
possibly burn off with vapor burner
but probably not necessary -

possibly film or varnish of
celeacid of soda with chemis
mixed will answer for the pen &
others -

Tragacanth - Iceland moss emulsive
gum arabic glycerine & chemis -
Albumen, Solution of Cellulose
in Chlorine - manduck diff(?)
then, dipped in alcohol & then
washed & impregnated with
proper chemical -

Celluloid Bordeaux Sulphydrate of ammonia to reduce –

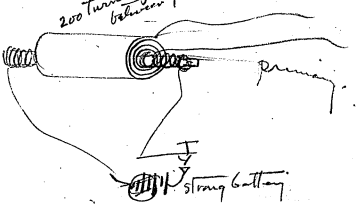
Hard Soap solution.
Cylinder of phono without the Cerasin then moistened + turned off the mordanting water containing proper Chems or bade contact, thus gives beautiful surface –



Also the transparent soap dissolved in alcohol + mandril dipped – to get a film + then impregnated with chemicals. In case of Tea pen dont need anything but the Na already in soap

Try & get some Dry Balmain luminous paint, & grind it more impalpable to make a screen & try in place of a photo.

200 turns of sheet ~~lead~~ tin foil between paraffine paper.

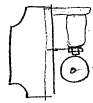


this is a Condenser-Coil — Study the action.

Make a Tesla or buy a Tesla Coil — I made one find it —.

Investigate the X ray act. Elihu Thomson acetone —

get books on Wireless telegraphy D Van Nostrand



Cylinder metal.
a small piece of the porous material in spring — cylinder of brass, nickel plated & polished —

Can try small crystals Etc.
get good lens —

16

24
150
80

150. / 746.0 (5
4

16
80.

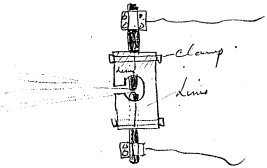
9 | 100.0 (11.1
9.0
1.0
1

11.1
222
1

122.
120
2.4
122
140.4
1

get something that makes a noise, then listen to it in a quiet room so can just hear it. Then take it into noisy shop & see if hear it better to prove that cause of hearing persons in noise is due to their raising their voice —

for ~~sep~~ to duplicate examples process in storage battery use non Coated Baiff process (10) superheated steam —



To obtain a very high temp to see if X ray shows up way beyond ultra violet - also to test fluorescence of all the slides as different crystals shined flourescence as the temp rises and the rate of vibration increases also the ultra red is extended as well -

1944 ½ here

Make good latest X ray tube.
only coat the platinum with a
piece of lime glass & see what
change it makes in the quality
of the ray —

Make Aluminum Condenser —
of thinnest sheet Al or lamb's
intestine, say ~~good~~ Mica very
thin & see if its charged
when X ray passes thro
it — or if it will give off
X ray — or discharge into
another X ray bulb —

See if one X ray bulb having its platina cupped & focused through the air to an adjacent X ray platina with flat object, vary this Experiment so the spot where it strikes glass is arranged so ray will go across air to another bulb —

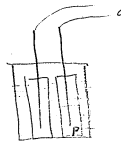
Don't forget the Cell of one side Celluloid & filled with oil & best X ray bulb immersed in it —

~~[illegible] 200 very thin~~
~~test tube~~ get 3 or 4 gross of
Very thin long Vials.

Lime glass if possible.

fill with all kinds of liquids.
Cork + seal - Mount on board -

~~test with~~
Light + X ray for fluorescence

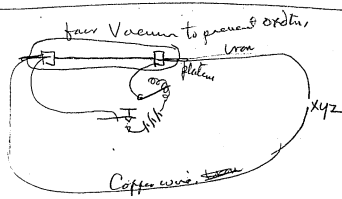


P forms cup
one with Crystals of an
acid other with Crystals
of an alkali —

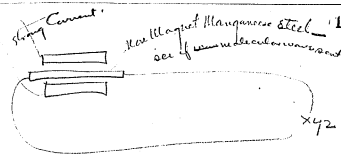
also one with soda + the other with
very quick dissolving Crystals,
Soda in outside sol = Idea being
going from Crystalline form to liquid
gives off energy = Try those Crystals
that give cold on dissolving also
those giving heat also giving
heat in one Cup & Crystals producing
cold in other Cup —

Fuse Electrolyte Thermo Experiment

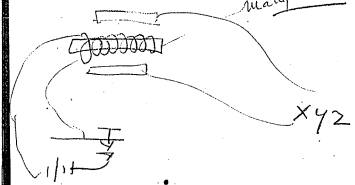
Copper & Iron – in iron crucible – use chalk chalk, Chl Zn & different Chlorides some Bromides, KCy – Alkaline Salts, also Nickel crucible – Silver Crucible, Borates, fusible glass enamels etc. see ~~of~~ Voltage & of Electrodes permanently attached –



Iron wire brought up to the recalescence point & then raised & lowered to see if a molecular wave is sent out ——



Possibly instead of magnet from another from comes out,



for Monochromatic Light
useful in Vac-Cooper Hewitt

also Sodium, Lithium Mg-
K

Frequency order of power of
Phosphorescence, 1st — least changed
Sulphides of Barium & Calcium — far excellent
1 = Yellow diamond
2 Amethyst & Fluorspar
3 Arragonite
4 Calcareous Concretions
5 Chalk
6 Apatite.
7 Heavy Spar
8 Dried Nitrate Calcium
9 " $CaCl_2$
10 Cyanide Calcium

Oxalate Lithium more sol Cold than hot water, this is peculiar to Bar & Ca Compounds perhaps this has something to do with fluorescence (see the chart)

a large number of Barium Compounds & Magnesium & its Carbonate in addition large number organic. Dry flowers, Silk Cheesecloth milk, shellac, teeth etc

Something Necessary —

Take an X ray tube Exhaust until no X ray vacuum to high. Now focus X ray on one or both poles from another active X ray bulb — This will break down the resistance — we shall get X rays of far higher power & perhaps peculiar quality, The Exhaustion can be continued until it again ceases to give X ray & the second or Exciting bulb can be made more powerful

If this doesn't work try
Ultra Violet light from
arc light in Lime Chamber
with aperture —

also try to bring it back
by putting bulb in strong
mag field — also in CO_2 snow —

Make following X ray
bulbs with plat | rium but
cup of Mag. Al, Zn Iron, Nickel
Lead Antimony Bismuth, Copper
Silver, Magnetite, Sulfide Ni
Sulfide Iron Graphite
see any phenomenon —

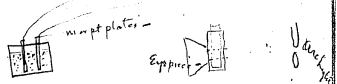
possibly with Ni or Fe Cupin
a magnet might deflect ray

air has least 1.00 & mica the most
5.00 specific inductive Capacity
possibly this is due to the layers of
so an artificial thing could be made
possibly of enormous Capacity —
Say dip fool in 1st Room in alcohol
then, ~~[illegible]~~ Hgcl in Ether, or
Turn the room
Make a hot ~~steel~~ the solvent
of each should not dissolve the
other, perhaps ~~Ether~~ phenom
will come up —

possibly a combustible will be
found where the Capacity is less
than air in underwater cable
good for telephone & cable

XYZ Recor

XYZ or S or Mag in wave



Oil in which extremely fine crystals which will float in the oil — or liquid.

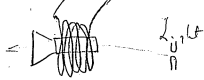
When waves comes particles or crystals set themselves parallel or in such a way as to affect the light coming through — The opalescence is changed

Even conducting liquids can be used for instance KOH, using Fe + Ni balling grids —

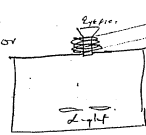
Crystals can be grown, any size but preferably microscopic — ones unbroken used, Various organic liquids used —

This will be a fruitful source of phenomena — Pardus mosquito or freezing Mag oxide should be sensitive, = metals etc

XYZ-9·E



or



Tube filled with oil etc + powders or powdered metals also magnetic oxide + finely divided metals. The wave causes particles to arrange themselves + change the opalescence — possibly better than a Branly — a fine for XYZ —

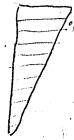
The sound produced in now by magnetization is very much stronger if a wire is used & a current is passed — use powerful current on a small off of wire + attach to XYZ Recvr use metallic cases

According to Matheson Cobalt is next to Bismuth as a Thermo, this Combined with Cast alloy gives more Voltage, Cobalt Cadmic got cheap & so practicable it also shows that there is a great field in high up alloys —

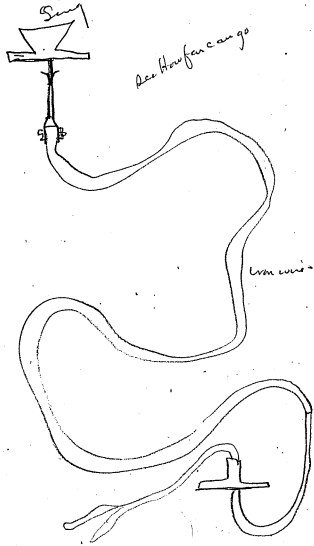
Telluro is 179 in regard to Sb 98 must take this a sec of Te can be got practical alone or in alloy proov the assertion as to Te — it would be a great gain —

Claimed Thermo alloy is 2 Sb 1 Zn see Hawthorne Compare with our Cast

perhaps the quality of phono
Cylinders could be bettered by
having say for piano a set
of Resonators tuned not for the
fundamental but for the 1st &
second overtones, these resonators
would answer for all other
sound including vocal; they
could be arranged around
the funnel or around the
sides —
or a number of fir-wood boxes
like these used for forks or

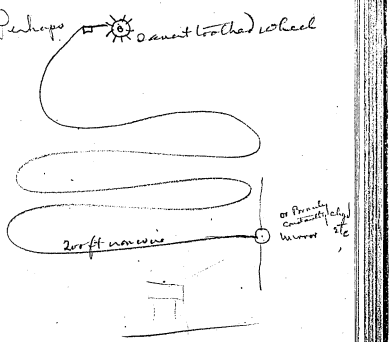


The ancients used
brass resonators to
strengthen the various
qualities ??


Sim
Ans How far can go
Iron wire

Guyot & Guthrie & Schelle each observed phenomena of attraction or repulsion exerted on suspended bodies by bodies vibrated in proximity — Say nothing is known of this phenomenon —

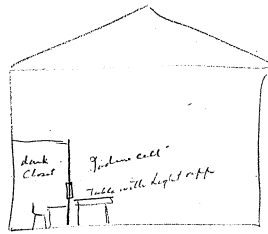
Perhaps



Indium in Bisulphide of Carbon is
impervious to all the visible rays from
an arc light but pervious to invisible
heat rays & very slight absorption
takes place —

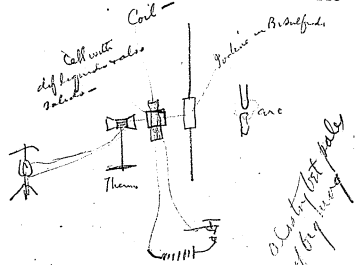
This is ideal for trying the crystal slides
for fluorescence & for photography
also for photo plates acted on by
invisible heat, for monochromatic
heat rays which might perform
work when plain arc lamp
would not also for low temp
radiation like from sulphur, hot
water etc — lamp filament 32 cp
at different temperatures in front
1/2 doz mounted close together & with
adjustable res —

Coach arrange items



Rock salt is transparent
heat only, light off

Mullen used a thermo pile & got
extraordinary results of heat absorption
possibly the ray might be altered by
the character of the metals of
the thermo stack and get Caught



test if powerful moving lines of force
will alter the nature of a legend
or solid through which invisible
radiant heat passes and cause
effect change in the thermopile —

Makes a 20 element new alloy cell
with N Cobalt or best in 1" dia
+ use 1/2 ohm Rolin Measure Gal
also telephone on secondary + pile in

Radiometer with Vanes of platinum also of tungstate Ca on glass or then subjected to X Ray —

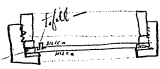
Have the alternating Current put in Galv Room to use with a Reg transformer 50 volts this can then be used with all kinds of Coils —

put in a Crucible packed in Charcoal a lot of anhydrous water made Crystals & bring them up to dif Temp — Also Hydrated Cryst — Is it possible to make large Cryst of Tungstate Na or by bring up slowly dehydrate & fuse to solid Crystal transparent —

Try this on a number of Crystals & if this possible a great many useful Experimental materials would be possibly — possibly Phosphorescency of Barium — phosphorescency sulfide/Ca Ba x Z

Refused salt, as good as Rock salt, plate — as plate

Make some Cells of Collodion — Mica glass, gelatin; the best form would be circular like telephone Top



gasket,

Bismuth

Aluminum, to run carbon on Ni to make it good enough — also on Mo Wo, Ur Mn Sb & others to get a metal & a high ox mixed to give combined

Cobalt given a good show = Cr = chromite — Mag ox of chrom

Uranium!

Battery =

New Idea — Grids of rubber or celluloid, mica etc mixtures of various things mixed with graphite flake pressed in Cake with graphite & clay pencil for Connection & acid radical solution Etc.

The infusible stearates of metals made into blocks by great hydraulic pressure ought to be valuable — also mixed with

procedure + heated & hydraulicked
pressed may give some very
useful Compounds. neutral
Oleates, Resinates (infusible)
would be cheap —

Perhaps Impure Soda
Large Cyst put in Vac +
gently heated Cohale or
Most of the Water Come
off & then packed in Charcoal
& heated to Carbolate
Try other Impurities, this may
lead to Something

possibly the Carbonization of Crystals like Sulphanilic acid Uric acid etc which decomp before melting would after the 1st Carbon be subjected to a higher temp in the furnace to Diamond or Carborundo

Look this up Watts at home for sub which decomp before melting & give out the Crystalline mass

---

Remember the very elastic filaments like rubber produced by high temp. dessicated oil or filaments of Thick Castor oil - reproduce conditions & see if to the Rosin or Cellulose part

produces the result, then
experiment on paper & see
if flexible sheets can be
made this way – possibly
a pepsin digestion would
help – This would be
valuable –

Mix hydrated Al_2O_3 with
gelatin, then pour in sheets
dry & then heat, the O leaves
it & oxdzs gelatin makes it
insoluble & if flexible
would be good material
try perox Mng – perox Ba

Per ox lead, CuO, hydrate, &
others – chromate Lead,
Ferric Chl –

Tetramelophosphate of lead
fluorescent with X ray
slightly – See effect of this fluor
to a glass –

Phono –

Try a diaphram which permits a
portion of the sound waves to pass
through. This would I think cut
those fundamentals to a reasonable
extent & stop harmonics –
200 mesh screen – Bolting cloth,
perforated battery 3½/1000 stiff with
cloth over it – This prevents call stiff

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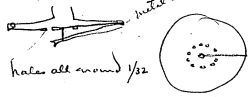
filter paper on perforated metallic disk
holes 1/16 diam 1/8 - 1/16 apart -
Charcoal -

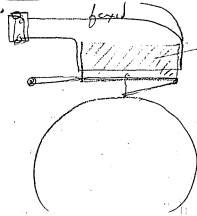
March 24 1902

Phenol -



March 24 1902

Phenol



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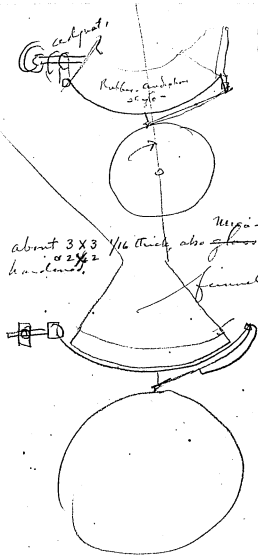
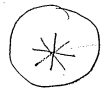
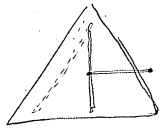
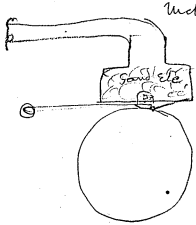

exhaust
Rubber, asbestos
about 3 X 3 1/16 thick, also ~~glass~~ Mica-
also steel
funnel.



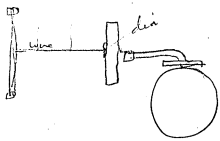


angle dia
in line to every nail
wood bridge across
in centre of wheel
to record the fo
lever

also bridge on
doubtful lever
shown



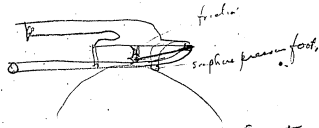
filled with sand charcoal etc. Saphire pressure foot, or full of disks of felt etc,



funnel lined with felt.

March 4 1902

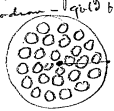
Use a funnel formed of a prolongation of a steel fish pole, which is 1/16 at one end & 5/16 at other, Continue it on from 5/16 to 6 inch dia & then a Bell mouth,

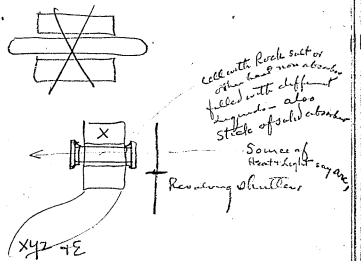


Connection by dia & record point by friction also of wax, glass etc –

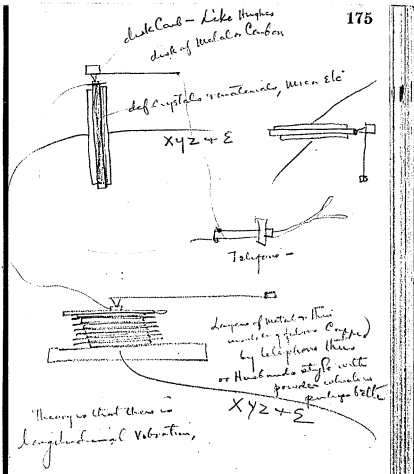
Smooth Cylinder dipped in a rapid drying solution like ether, Gasoline in which thick with an amorphous greasy organic ~~or lampblack~~ or a distilled water solution thick with amorphous and like pressure blue, ferrocyanide etc. dry cylinder, turn off ~~reverse~~ old Specimen, Vacplate, very ~~porous~~ no relation to dia —

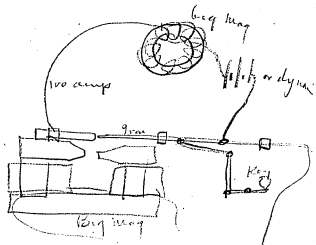
Dra metal perfd – over this thin film Collodion – gold beaters skin,





Theory being that bodies which absorb light or heat waves transform it into other forms of Energy; which may make local moving lines of force cutting the Coil X — Revolving Mirror serves to cause rise & fall of lines —


disk Carb – like Hughes
disk of Metal or Carbon
def. crystals or metal-carbon, micro etc
XYZ + Σ
Telephone –
Diagram of metal or thin
wire or fibres (copper)
by telephone theory
or Hughes or style with
powder which is
XYZ + Σ
Theory is that there is
longitudinal vibration,



Break circuit to give Cannon like break these waves traverse the air as sound waves + effect an XYZ or Branly type —
Idea being to transmit high frequency sound waves in air wave of better 100 or more miles or Electric waves will be mixed with the sound waves,

perhaps a Double Resonance with Molecular new Can be obtained thus Certainly should give a million a second sound waves wave length 1/6 of inch —

perhaps at extreme end of wave wave will get attraction by electrification of the air at surfaces, thus it would do with a branly

Put some Pulp Ni Cryst in sand, over ~~[illegible]~~ burner for hour it was porous + of some Color as Dried Hyprate, possibly H_2SO_4 all driven off + there being practically no ox. to the red NiO,

I put Carbonyl in O and some Crystals, ferrocy Kept to shape but was white + porous Ni Sulphate Kept shape fairly was fissured + turned to NiO — This be good thing for battery — Think a large lot of Crystals should be heated in

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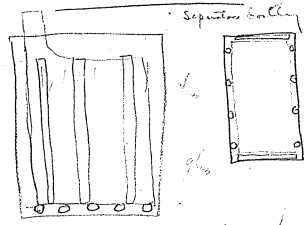
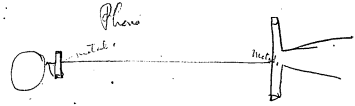
and then Experiment on slides for fluorescency — Can test rapidly on platinum spoon into a dish full of heating — In fact a spoon might be used + everything have to written down off or put on slides — being from Crystals, they might hold Crystals properly all thing + get having no water might fluoresce Etc



to and to Thursday Morn

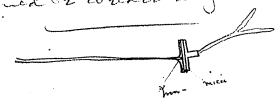
or

Phono



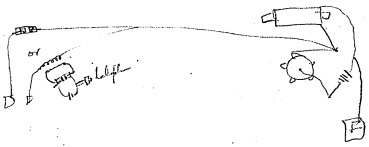
If Vibrations of sound through a wire or Brass wheel or blast or organ key — 1 million seconds, the wave length will be 1/16 large a Bromley with wire extending into tube & joined with water — the action plunger can be regulable, when 1/32 or 1/16 obtained set up a vibration or agitate powder which can be continually electrified then vibration breaking out — Can turn by moving plunger — Brass wire shaped by welded at junction —

or



all tones produced by vibrating bodies.

from the way phenoplex wks in
wet weather with wires on ground
it is possible that a bare wire
buried from long in wet
would transmit a Wireless Sec
wave more or Branly - using
discharge of big primary broken
by air Gap or mag



~~[illegible]~~ Didymium may be
a good Body in battery. gives a pos of
which gives off O when heated
acids. — Insul KOH

In forming Crystals their form changes according to solvent from which they are crystalized from, for instance Iodoform may crystalize entirely different when using KOH, etc —

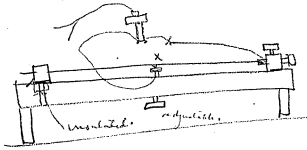
Make few slides of X ray & ultra violet fluorescence from solutions, with a salt of same ion also strong salts not crystalizable & not incomprehensible —

Also there is a marked dif according to the temp of the solution when crystalizing

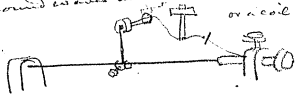
Sublimed Mercuric Iodide gives yellow cry which by slight touch turn scarlet & slowly throughout

Means when crystals are touching
with a slight motion —
This might be used as Indicator for
Sound or non wave or XYZ —
also, it might be affected to turn
scarlet then yellow & back to
scarlet by a certain form of
others waves — its def form of
Crystalline structure that makes
Changes of Color hence being on
the verge it should be ~~[illegible]~~ liable
to be changed from one to the other
Easily —

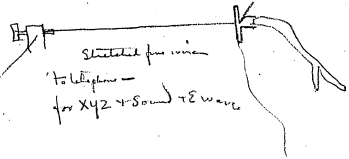
In forming large Crystals
large flat dishes should be
used & gently garnished on
the inside to prevent creeping
~~[illegible]~~



shielded wires, to detect XYZ +
Sound or wave or wave etc. Can pick up X
or a coil



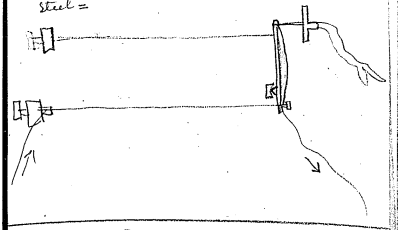
Wrapped wire. Can be Coiled etc.



Shielded for wires
'to telephone —
for XYZ + Sound + E wave

Wrotheim says Coefficient of Elasticity varied by Elec Current, independent of the heat caused by its passage.

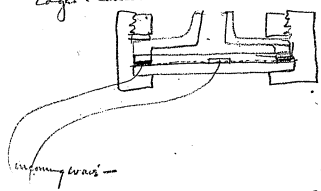
Try silver-phosphor bronze platinum platinum iridium Copper iron Nickel Cobalt, Rhodium metal, steel =



for recg sound waves over long wire make telephone receiver with adjustable air chamber adjustable by screw from 5/1000 to one inch — to get resonance —

A Franklin fastened to diaphragm ~~[illegible]~~ might give results.

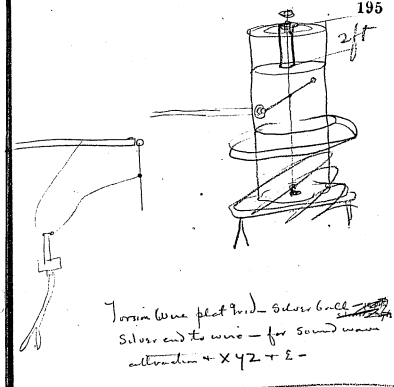
Telephone adjustable with Mica diaphm + a glass dia heavy smoked over with lampblack from a point of wick of lamp + connected around Edges + center

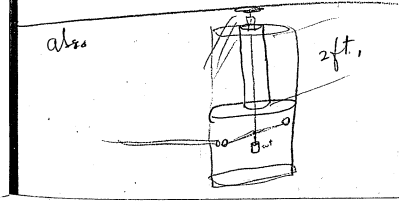


incoming waves —

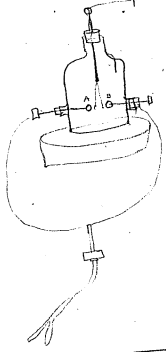
The passage of waves E or XYZ across lampblack ole heats the air + if there is a break tuning fork gives say 200 breaks for each dot formed of waves of millength sec

A wheel gives sound for molecular a dot (least 1/4 sec) formed of waves going at rate million in sec The wheel breaks intervals of 200 breaks making sound

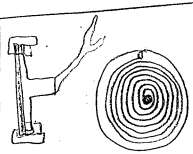

2 ft
Torsion (wire float fric) – Silver bell
Silver end to wire – for sound waves
attraction + X Y Z + E –


also
2 ft,
out

X42. E or Sound



Electroscope
adjusted to "sway"
from A. B – or Sound.



deak of porous pot or Lithograph
Stone or Compressed charcoal
powdered over with platinum plus
in water in a glass of –
also graphite nickel in
Carbon – These form block
of a telephone & pressing
of a wave current now in
Telephone channelled to
Earphones) + Throw gives
sounds ——

possibly fused Iodides Cuprous
made to mix with Thermo alloys
of light specific gravity —
This might make a fine Thermo alloy
also sulphides Zc & Selenides —
antimonides, arsenides

Organic liquid Galvanoplasty — Troy
Copper poles in organic non conducting liquid
with an Organic Salt of Copper dissolved
see if plate with Current,
also other metals, —

Storage Bat separators ebonite Cell —
Chlorinated & Brominated Organic
substances in some Cases not
attacked by boiling KOH,
Tribromophenol Bromide dissolves Benzine
~~Cup~~ Sol Bromide C not attacked by
boiling KOH —

It may be possible to make a
Strange Coalition with Organic bodies
The Zinc Salt of an Organic acid and
in the liquid and pass an Oxygen
stream Salt say a Organic acid
Mercury manganese salt or Pb — If would
have great Regularities but plates
Could be large and very close together
say 3/1000 — More like a Condensation
method in great number in Multiple Res
might be got low enough — Its
worth trying —

Quinone has greatest power to
Crystalize of almost any known
substance. If even small
Quantities are sublimed
Crystals can much long and
obtained — This means a small
abnormal —
Its volatile that at even ordy
temperature it sublimes from

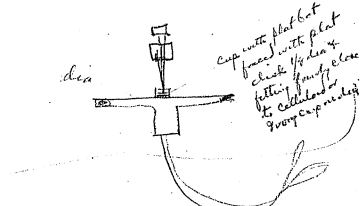
oxuvade of the oxuvade to the
ethers also crystalizes from H_2O –
but strong acids, including the sulpho
the strong oxidizing agents, in alkali
absorbs O from air turns black
its ablaned by oxidation Quinic acid
can be detected 1 part in a million
by Hydrocarcoligone – why not
look proper in Quinic acid +
Hydroc + then with flat point
oxidize by Cinnamt for lately –
Via peroxide = Bitter = S sapiste a.
permit oxidizer take place generally –
Quinhydrone is another abnormal
Substance see Schorlemer
or green hydroquinone – very
strange! – It forms the most
beautiful substance coloured
Organic chemistry has
yet predominant Crystals

bear a resemblance to the
feathers of the humming bird
on white porcelain (Chem. News 93).
Uses on it presents a unusual
beautiful appearance,

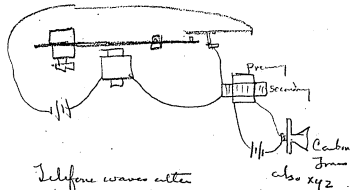
Hydroxy quinoxaline or
Mononitroresorcinol - decomp
without melting =

Azorsorufin. test for alkali
Sensitive, for testing Chem. recent
"Resorcinol blue" in discolor.
by Zinc dust very sensitive
hence that pass on Hydrogen
pole =

pyro gallol. in water turned
Brown by Nitrous oxide, use
Nitrite K + plat pen O side —
as K gives black this with parallel
pens give Cinnamon mark —



in then non condens oils etc
for X y Z & Sound
if non condens. do not carbon try Cop Sulphate &
blue litt solution also Cu + palladium
also KOH to make gas — if platin
Reduce use wooden disk with fine point
ODZ in Chlor to Concentrate the gas

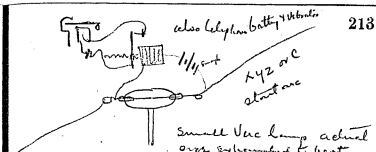


Telefone waves alter sound by modifying the arc at points — use 10 cells round ring to suit to get long arc at points —

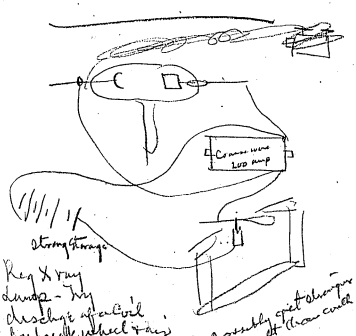
With Organic liquid Storage Battery — Try as base Benzol & Reg grids with graphite + Ox quin Subs + other grid with an oxidable material pyrogallic a. Hydroxylamine & such like used in the Benzol. after trying a large number change Base liquid from Benzol to say Pyridin & so on

I think O or Hydroxyl ought
pass across a non conducting liquid
Eisen changes the other electrode
which being continuously changed
+ discharged gives a current by millions
of intact stress changes without
any current passing through
liquid at all – persistence in
experimenting will surely turn
up something startling in this
direction, depositing Zn on
heavily oxidized Magnesium proves
that static stresses can give
current if frequently passed.

(1c) a dielectric can be stressed + discharged
millions ~~of times a~~ second by chemical
reactions within the dielectric



also use in dark box alone & notice
light - Vacuum change running in it.
test with ether & 1st.



Organic storage bat

It is likely that with NiO_2 + Fe grid in an organic hydroxyl compound dissolved in an organic liquid that OH will be transferred + work.

Get all the Commercial Aniline Colors with descriptive Catalogue giving name + structure if possible if only name see Allen, Rosen + Schlenk etc for nature of salt these can be easily manipulated to make very many compounds + salts for Organic X42 bat + storage

Amido-azobenzine can easily be oxidized & reduced — its a weak basic acid & salts are decomp by H_2O —

Chem Tdgh — Helianthin, Tropaeolin D Orange III. is

Dimethylamido-azobenzene, changes from a yellow to a red by acids. used instead of Litmus — (Ammonium Salt)

Phenylamido-azobenzene Sulphonic Q K salt, acid colors red also used for titration —

Chrysoïdin derived in dilute shellac used by Phalogho paint-window dark brown — Schubert 310 vol 3

Concentrated Sulphuric Acid is non Corr. + dissolves lots of organic materials —

Dis aniline black - forming a sulfonic acid easily reduced + oxdyd - Bat.

Indophenols - Easy ox + red

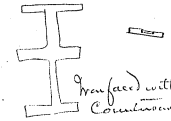
Trichlorophenol-blue " "

Lauth's white - Leucothionine ox + chrome rapidly in air

Methylene white "

Methylene Blue ox + red

Storage Battery Separators –



Iron (face) with Mica 1/8 thick
Commutator 1/16 + rivited

Is the new Can use cheap small sizes
30c lb Mica –

Pack edges & Ends with strips of
Mica 1/4 wide 1" long if full up –
or hollow glass balls, or glass tubes
1/8 dia 1" long –

Probably best solution is to
Contain Elements on a proper
Enamel –

Try the Experiment with a thermopile — that when iron is magnetized its temperature falls, same as when junction of a thermo-couple Current passed it gets Cold —

Curious remark in Tyndall
Whenever the effects of Electricity are reversed heat is produced, whenever the effects ordinarily produced by heat are otherwise produced Cold is the result —

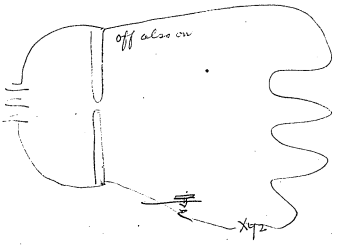
Get large piece Scheelite Cut into a prism — have a slot like spectroscope & grind all around slot with lens have it in dark box — see nature of spectrum & studies

see if Oxalate Lithium Can be
fused so that fluorescen
by arc light so make a
prism - also try it in regular
Spectroscope with Quartz prism
in the Ultra see what part it
fluoresces in -

[illegible]

[illegible]

Make small Dynamo with a [illegible]
Disruptive Coil [illegible] Core [illegible]
revolving Core [illegible] wire parallell
to [illegible] [illegible] rings
see if [illegible]



Vibrations in one ear by waves
of analogous to sound —

Improvement in telephone Induction
Coil. Secondary wound with flat ribbon

a cb like a Condenser
Wire, rather
than the foil.

It will be sharper.

Like Polyp of the Improved pond — one of
natural opinion, also Cornet,
Howes Cocker for Repeat —

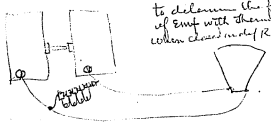
Worth Beck & Rufus about arranging with def people on Committee for patents — [illegible]

Put a connecter on Mattey by Gaumont Francois
Nonny pls potentials, & after get everything filed [illegible]
or perhaps [illegible] patent —

File 225 the [illegible] by Francois [illegible] with [illegible] —
also operate [illegible], see [illegible] [illegible] —

1 Pb on Cooling Mo on [illegible] by [illegible] [illegible] —
2 [illegible] with [illegible] [illegible] [illegible] to [illegible]
bottom — also Cups [illegible] to [illegible]
[illegible] [illegible] [illegible] — Vent with [illegible]
[illegible] [illegible] [illegible] [illegible] by [illegible]
of [illegible] —

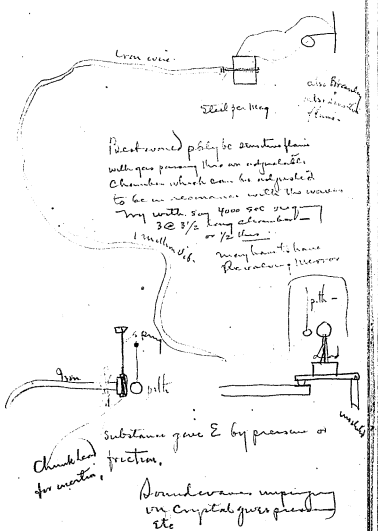
Use this or test
to determine the fall
of Emf with thermo-alloy,
when closed circuit of Res



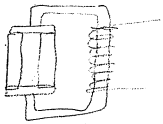
This will give approx resistance
+ Value —

1000
4000) 12000

Sound Rays



3000 $\frac{40000 \quad 6000}{24\,000\,000}$



Don't forget to tumble Dundee over to see of capacitie & H.m electrify different if so capacitie Can be lifted out independently —

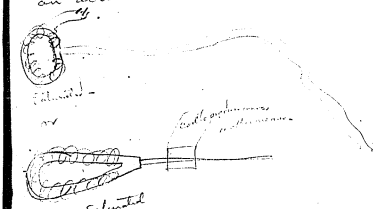
1000 volts Spark Experiment — no coil —

Telephone,
powder - Coherer by volts & sound — no coil
decohere — no coil - ought to be very loud.
diff powders

Sulphide of Copper should alloy with every other metal also of Fe etc & almost unlimited number of alloys Can be made in this way for Thermo —

Acetylene gas would be good for lighting sometime flames. I think —

Transmission of sound waves over steel wires may want an abutment.

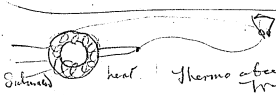


Theory

abutment for Ether waves

Ether itself to absorb heat to limit

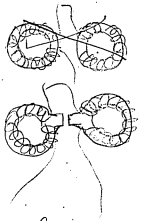
When Cop. wire passes through the heated



Thermo abutment try

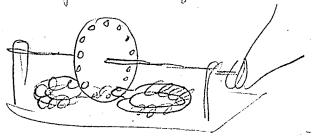
If Becquerel theory is right that thermo currents are due to unequal heat conduction of a current, then Copper + one of those Manganese alloys named for insulation ought to be good

Clammonds Thermo gives 6 watts hours for 3 cubic ft gas or 2 watt hours per cubic ft gas 375 cubic ft per hp hour — gas at 70 cents per thousand at orange is 25c per hp hour.

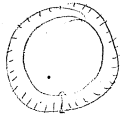


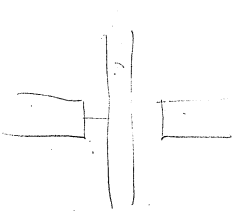
Etheric Abutments

Observe any phenomenon by
Whirling Crystals through the gap
fastened to a disk especially
fluorescent phosphat Crystals,

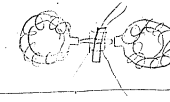


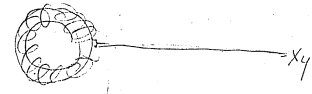
Try calling with lamp
to get Current — O V S





abo



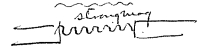


powerful "Uniform
Leyden discharge"

Theory –

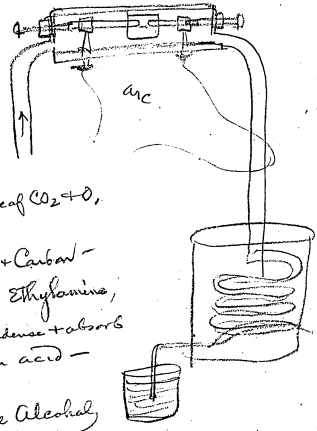
When an Electromagnet is made by Current the molecules or molecular Crystals act Unimolecular parallel + in lines at right angles to the curve, they butt on each other, in so doing the Ether lines which Inflection "the pulses at air gap instead of being straight are now bent just as in a vibration of light, the strength the Magnetism the greater the bow of

the ether waves



A Copper wire loop passing through the ether waves. when straight + normal offers no resistance because the line has great elasticity hence no current but if ether line is bent in waves near to limits of elasticity then it offers resistance, when the Copper loop is open there is no abutment + passing the loop thro the molecules of Copper are opened, & by the Ether line and work lose out. When Copper loop closed the molecules rebell on each other + as the Ether is near limits of amplitudes it requires work to shove it through

The disturbance of the Copper abutments as such disturbance passes of which there are Millions in a Millimetre causes a waves to pass & this is given off as heat, this waves or movement of molecules is transferred to other places it gives off heat there. What gives direction is that the abutments are either shower at one end of magnet than the other – ~~or that the end of the~~ ~~U~~ This point should be worked out more <u>direction</u> is the difficulty =



air free of CO_2 + O_2

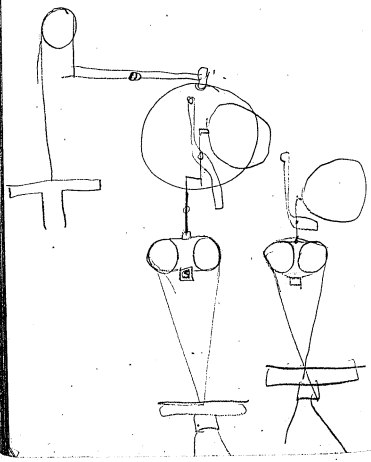
Lime + Carbon —
forms Ethylamine,
Condense + absorb
in an acid —

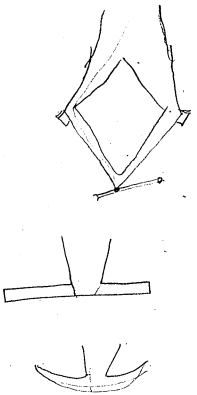
Make Alcohol

Stearate of alumina swells enormously in Benzol if slightly heated. Can probably make with 1 lb of S over 100 lbs of Benzol gelly. Its like the Ether of page 4 Try Expmt

pour Benzol on top see if ~~[illegible]~~ pure Benzol can bottom through 0 [illegible] 200 mesh at any particular point,

12 5000
60 000 | 1 000 000 (16
60 000
400 000





Sealed cell —
water in 7c.
glass bottom,
800.
20
16,000 —
mean weather —
800
single cell —
240 —

110 1050 150 gal 30 ft
3
315 —
1 HPE

12
2 well horse
per Carbrett gal

2 | 746 Carbrett per HP H —
3 | 3 | 3 —
25c per HP H
50 ft.

1/18 millionth of 800
50
900 —

150
16
75 — 90 0
10
1 1 0 0 | 3.2.
2 4 8 0 0
2 4 8 0 0
.746 | 20.
1.2 1.6
1.6
72
12
17.2 — 1/2 mile — 900

20 | 130 | 6
120
10
16
17
112
16 cells — 16
2027 2 —

5 = 40
25
24,000
1,000
1,000,000
1,31,000

120
430
30 min —
120
1,500.00

1 mile 10 Rev min —

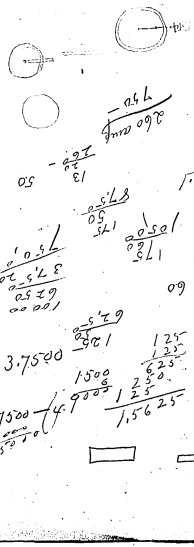
15 miles HP — 131,000. | 200000 | 15 —
85
75.
120
1277

15
70
70
0,5 —
10 miles HP —

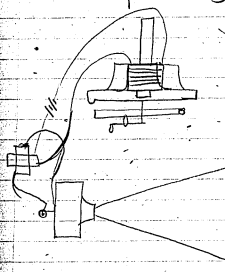
32½ miles
3 140 —

Notebook, N-02-04-18.1

This notebook contains dated entries from March-April and December 1902 and from October 1903. All entries are by Edison. Included are notes and drawings regarding phonograph recording and reproducing apparatus and the composition of phonograph cylinders. Several entries indicate that some material was transcribed from notebooks used at Edison's laboratory at Fort Myers, Florida. Also included are notes and drawings relating to storage batteries and to an alternating current rectifier. The front cover is labeled "Important Disc Expmts." This may indicate that the book was copied, or referred to, at a later date, since the phonograph entries pertain only to cylinder technology. The pages are unnumbered. Approximately 80 pages have been used.


4 times
12 1/8
1/8 X 1/4
1/8 X 1/16
3.7500
1.5625
72.

Phonograph Experiments
April 18 1902 -

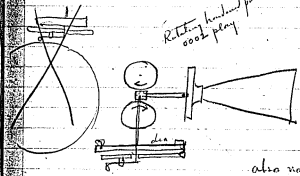


Bell diaphragm on phono - talking to a good Microph + large funnel -

also Carbon button in place of magnet

April 18 1902

Entd from the book Mch 21 1902

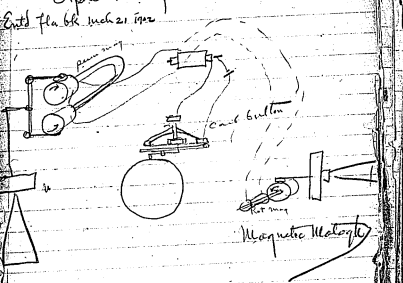


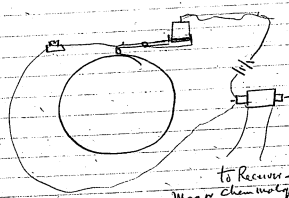
also non revg wheels
+ Rubber friction revg
Rolled surface - Cylinder to
~~revolve~~ Cone of of friction
or roller.

or Carbonaceous Stone - Meerschaum, steels, Lithographic stone + rubber
Very likely with wheels of a compact like Cork or stone + a
Substitution slightly flowing will get a Mechanical life.

April 18 1902

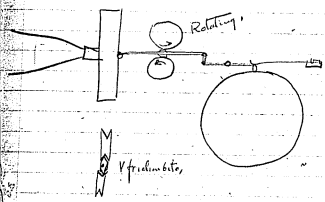
Entd Flu bk March 21 1902

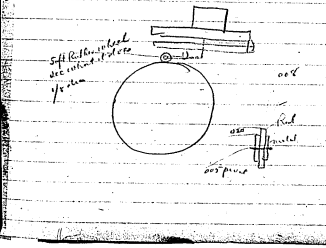




April 18 1902

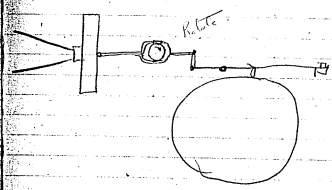
for flat bk — Mch 21 1902

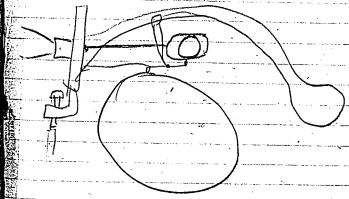




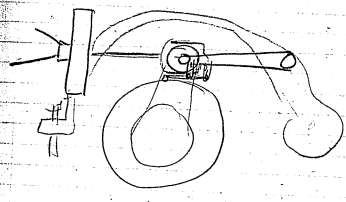
April 18 1902

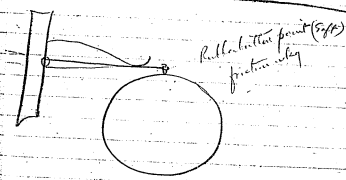
Edel
flubk March 22 1902





April 18 1902

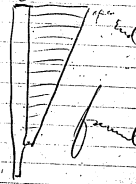




plumbago smoothed record
+ try platina button, highly polished
may make diff. contact & give
perfect reproduction also
good telephone & rusty black
smeared of plago

The ancients used brass resonators to
strengthen the voices of actors!

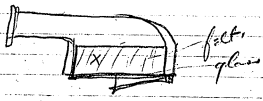
Resonators turned to
overtones & not
fundamentals.



Try diaphragms which leak sound waves to tone down the fundamentals & increase overtones

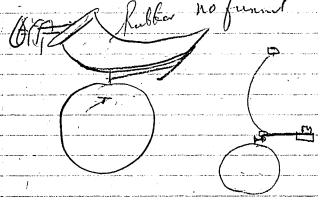
200 mesh screen, Bolting cloth, perforated cups of grid of Gauzing with porous cloth over it. Sweat filter paper on 200 mesh screen – etc.

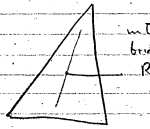
Also Req ~~[illegible]~~ Resonator with Aluminum or steel disc with row holes .005" all around



felt or powdered charcoal or other powders,

Think of Cavity of req recorder
was made larger or powder of a
heavy metal pounded in Sound
would go through it dia would
be diminished
would have to use pressure foot of Saphire





angle dia
in time both every note
bridge across to which
Recording point
fastened,

would have to be large & calculated for pressure

Line a funnel with felt

Steel fish pole for funnel + probing it.

perforated dia
Coated over with
Collodion —

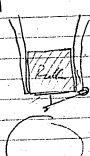
Dip a cylinder in a mush of amorphous sub like Ferroc Fe Ferroc Cu or substance that dries to a fluffy powder, mix with Ether Alcohol or gravium to dry quick — then prepared by using Acid Specific + Reagent like Water now ready give to Wurth to plate there will be no reputation to dia — can bring out overtones fine etc. a

April 18 1902

Matrix made this way shaved from perfect moulded Cylinder

Lampblack, Oxlime etc

Possibly Rubber would act like air



Materials for Cylinders &
Mixing with Phono Cylinder

Lanolin is an alcohol from
sheeps wool, its like Vaseline
might do for mixing Merck sells it

Spermaceti is palmitate of
Cetyl (16) Palmitic acid +
Cetyl alcohol, palmitic acid
is a close brother to Stearic acid
ordinary Spermaceti has some oil
in it. Cold Ethyl alcohol
dissolves out the oil,

Beeswax mostly composed of
palmitate of Myricyl,
Myricyl is an alcohol, powder
the Beeswax = Ethyl alcohol dissol
out everything leaving the
Myricyl alcohol.

Chinese wax. This is a beautiful white wax - it is very peculiar, its somewhat like spermaceti.
It is Cerotate of Ceryl.
Cerotic acid is somewhat like stearic acid -

Stearate of Ethyl is waxlike and easily fusible,

Dodecatyl is the solid alcohol in Sperm + Bottlenose whale oil

Ricinolin is the acid in Castor oil -

Elaïdin is the solid in Olive oil

Chlorostearic Acid –
Made by treating Stearic acid at 212° with Chlorine, (dry) it gets thicker & forms a Resin, This resin forms with Soda or Potash an amorphous Soap. Can form subsalicus or Soaps with all the metals,

Stearate of methyl
Semitranspherent crystaline Mass. Easy made

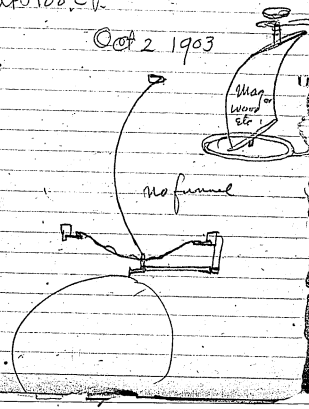
Stearate of Ethyl, Translucent mass, soft at 1st afterwards hard & brittle, Easy made.

Monostearin, hard friable
waxy mass.

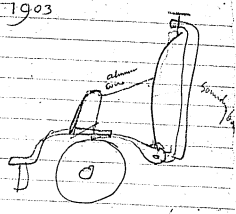
Ethal = (Hydrate of Cetyl) Merck has it

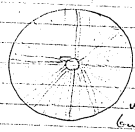
Cetylate of Sodium solid
MPl 100 C.

Oct 2 1903



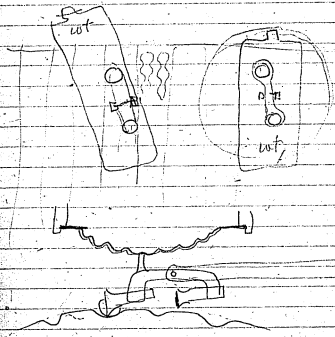
Oct 2nd 1903





Rubber wheel segments
Illy Corrugated but
so there are 6 segments
unbreakable thermometers
but not accurate
there was more amplitude than if the
vibrator on 2 legs or a whole like ones we
now have

Oct 2. 1903 Phano –



Double Recorder
Knobs 20/1000 2 metal
one of 40 Pipes – Reeded
automatic dance – manual –
The gives 5 on the
accepting index

Oct 2 1903 –

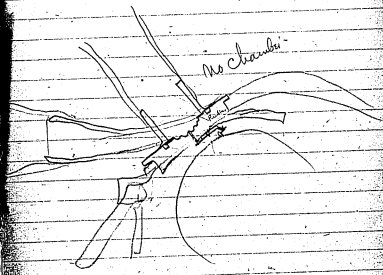
With the 1¼ drawed Car dia. the rubber to be pulled is a strip 3/64 wide + 3.75 inches long as the dia. revolves as a wheel, then this amount of rubber must be stretched + work done by using 61/100 diaphm – the total pressure on the diaphm will be the same if funnel angle carried out properly but now the diaphm will have a larger amplitude because the amount of rubber to be stretched is half + therefore double the amplitude will only require the work on the smaller area of rubber at edges of the same as on 1.25 dia with ½ the amplitude, thus not result to doubling the amplitude or quadrupling the Volume or strength of sound – in addition the mass of rubber to be moved is about 4 times less hence inertia will tend to distort the true sound waves very much less –

The area of Bag 1¼ is equivalent to bending a bar 1/4 inch wide 1/8 deep where the 61/100 diaphm only has to bend a piece 1/8 by 1/8 or half the work for same amplitude the total thickness is ½ on the small dia to make it follow the

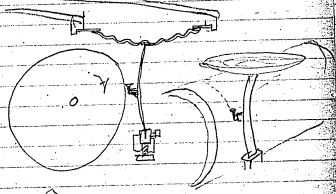
Thos — Elly

Oct 2d 1903

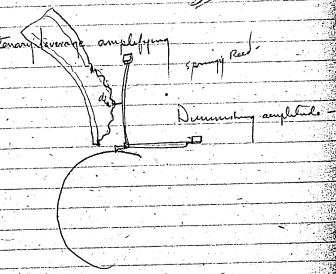
sound waves which would be a defect were
it not for the fact that the weight to be
moved is only one quarter therefore dont need
the elasticity or spring action — Thus we
keep approaching the human ear
Especially if we have negative leverage of
the vibrating knife on the bone
This idea is applicable to reproducers
but not with equal advantage



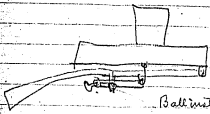
Oct 3rd 1903 —



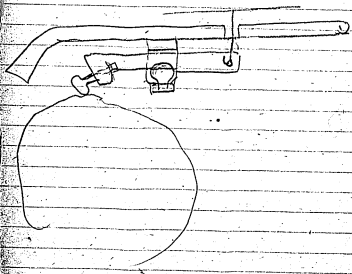
Catenary Tuning amplifying



Oct 3rd 1903 —



Ball in end of shaft so lined by universal joint back on side —



Oct 3rd 1903 –

Thinnest Rubber sheet we have been able to get is .006 – make some thinner by flowing with film dope device, Rubber dissolved Benzol on greased glass other colour dry film brown with Chloride Sulphur. Can probably get it .001 thick Can use ~~thick~~ rings cut out from this for the Recorders with 3/4 inch diameter and less. The .001 would do for the 3/8 dia diaphm Corrugated & dished –

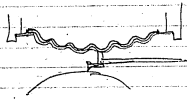
Make some blanks for recording by using dry cutting dyes etc that are easy to cut but not hitherto used owing on account of Capacity effects –
Pour on polished Copper mould thin say 1/32 inch, conc 15/1000 – pour just above melting point & suddenly chill by water with Salt etc so far below freezing point as possible

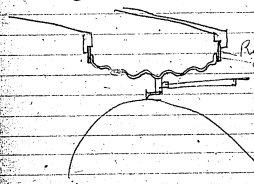
MB

Oct 3rd 1903

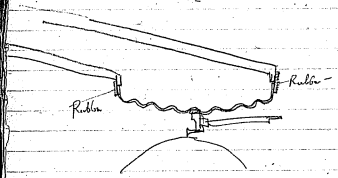
Use Stearic acid alone & with palmitic
" Chinese Wax " " other things
Spermaceti " "
Hydrat MP Paraffine — "
Ozocerite purified Crude — "
Japan Wax " "
Benzoic acid " "
Salicylic " " & about of other "
& other Crystalline Methods Organic
like Naphthalene, Alpha Napthal, Beta
Anthracene, Picric — Naphthylamine — Etc
These chilling will probably make
most of them amorphous & probably
they will not change to crystalline
form before can get an Electrolytic
Mould from them —
To get the best results the Mould
should be heated to same point
as liquid so the chill should
be due to the Cold liquid —
Possibly a thinner black shell
varnish & false shell so as to
prevent stains & Cracking
See further on in book for
other substances

Oct 4 1903 John Ott making
the chill mould for the chilling
Records - $15.-



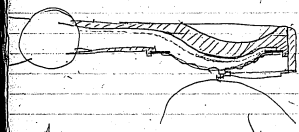


Oct 4 1903 — Phono —

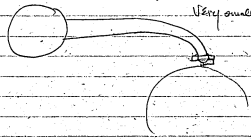


For hard material for Records try a mixture of Asphalt, say Syrian with a little Solid KOH to correct acidity & add Carnauba. This material is very hard so it can accurately be cut with Saphire recorder a great deal deeper of record — think (amplitude can be doubled) possibly purified Trinidad Could be used if grit got out Hard Cubian anyday. It would be cheap

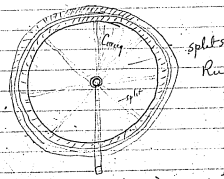
Oct 4 1903 Thom

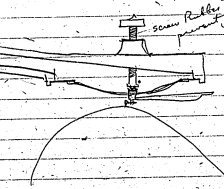


Smaller Chamber for Reg Recorder – can be even smaller as dotted line
This will increase the pressure –

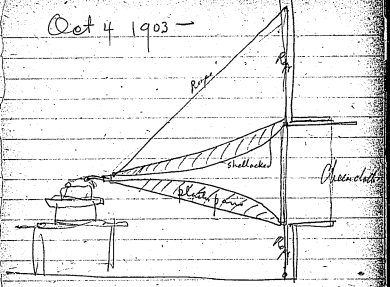


Oct 4 1903—


Ring
Split section Comp'd
Rubber clamp
Split

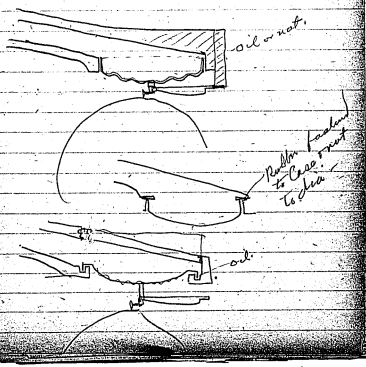

screw
Rubber tip
pressure gauge point

Oct 4 1903 —



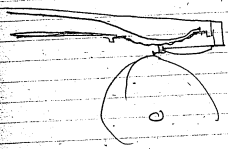
Oct 6 1903

My old Rapider with piston can I think be made to work by choose filling a wood cup and a lever to give sequence. Practically — in any Event with an oil of just a suitable viscosity.

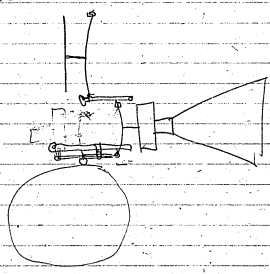


Oct 6 1904

It may be possible that I have any Chamber too large in dished Corrugated Recoil Can make this



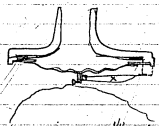
Oct 6 1903
Repeater



Think that with .002 or .003 Rubber around Edges that floating cot on Repeater can be dispensed with the stiffness of the Rubber taking care of the secondary of the Repeat Record —

OVR

Oct 6 1903



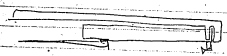
X fastened & pulled out say 1/16 — possibly 3/64 only.
The records will not run out over 1/16 — make rubber so thin that strain will be no greater than what weight would give hence record not be worn any greater, Rubber was .002 magnesium for lightness & Acid Cured rubber tissue, & X wood bamboo or Aluminum — If piston Reeds can be got off this with reed would be perfect —

Fred Ott made this Reed today it was good but not as loud as Reg balance There was no leverage Rubber was 5/1000 & only 3/64 free shaved to 3/32 & .003 Rubber the defect is want of self tracking

500,000

2 1/2"

Oct 6 1903



See if a thin shell of flexible metal can be glut on a Master by dipping a than shrink out,
Also try gutta percha dip & then Reg wax dip & shrink Compound record out gutta gives rough surface.

Try Experiment of shellac's made of Master Matrix ~~with the~~ Dry perfectly & dip Reg. Think use carpet a hard shellac surface — Coned dope shellac with dampblock clay to to harden & paint it on or a thin dip & dip right off in Reg Record wax & finish in Reg wax

18) 133 (7.4 – 18 plate 1.66 amp per plate
126
7 20

30) 248 (8.2 1 amp per plate
240
8 0
6

45) 363 (8
360
3 0

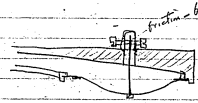
18) 30 (1.66
18
120
108
12

Oct 6 1903

Possibly film dupes could be made of dry cured dips & whole freeze together – perhaps cured by printed in Bath of mix of Asphalt & Carmine & opt hard embalmer or purpose in that manner

Try Bismuth for Vac deposit on Records its shy deposit & I dont think will oxidize – it can be put on thick

friction & bath angles –



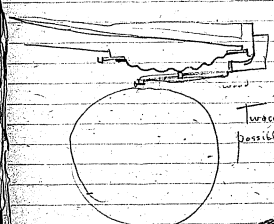
Oct 6 1903

Materials for master records to be tried in new powerful ebullition method to turn from highly crystalline to amorphous

Acetanilide MP 113 C 43 c lb -
Benzoic acid MP 121 C
~~Sol~~ Palmitic. Merck 75 c lb -
Picric MP 122 C 24 c oz -
phthalic anhydride acid sublime MP 24 c
Salicylic acid MP 156 C 76 c lb
Succinic acid sublime 1 00 lb -
Antimony hydrochloride MP 190 - 24 c oz
anthracene MP 213 C 24 c oz
Antifebrin 15 c oz MP 113 C mg. tria
~~Dibromated para Benzene MP 89 C~~
Betol MP 95 C 60 c oz
Monobromated Camphor 22 c oz MP 76 C
C made from Merck Indy.

Oct 7 1903

I think with new wedge shaped shaded Cow Vib at Edge Recorder that we have now reached a point where we can increase leverage on Recorder thus or prove that Contrary or neg leverage is the thing



These amplitude — possibly 3 times the amp

Showing above that getting rid of big power + neg leverage is a big thing. Microresolution of Dia must be increased or Neg leverage increased if quietly is improved

Oct 7 1903

Perhaps charcoal heated just enough to make it conducting will in 40 @ 45 per 100H with a charged Nickel from Storage Battery. see if get Voltage from heat it gradually up + note Amp when Voltage stands + amount diff Current, pinning Battery.

Oct 8th Make some masters Matrices by taking a master record + moulding around it a shell of phosphate Zinc. Same as used by dentist. this will set hard Make 1/4 to 3/8 thick - this will set + make Matrix for dupping process, the phos Zinc will not be hurt by heat, try all the plants to get rid of air + proper mixing of Cement also try Oxychloride of Magnesia, Zinc etc. platinite paste (fake) — also plumbago or Wax surface — also try gold vac + then plate only Copper for 1 hour take out + back up 1/4 inch

Oct 8 1903

Phos Zinc — by Portland Cement, this will quicken the process

After thinking over all the experiments we have tried on nonflexing diaphrm + considering the sound waves as if it were fluctuation in any compound on the Recorder being the cylinder — it is evident that the nonflexing diaphrm is a great advance in the art. That there is a relation or "best point" between the weight of the vibrating piston + parts and the diameter of the piston or diaphrm — that probably 1 to 1 4 inches is best. that the lightest, stiffest possible material should be used + dished + corrugated so strongly that if clamped at edges ——— no sound waves would be recorded on a phonograph, except in the FAINTEST musical degree. That the Rubber etc should be very thin + perfectly centralized + connected. that the capacity of diaphrm to move freely in a horizontal plane is a big thing as it prevents cramping off the fixed end + dia or rear diaphrm

Oct 8 1903

a circle experiment, I also assume that the disc being non flexing can have no fundamental tone of its own or any section in tone with higher notes, & as a low tone the disc has will be due to the joint elasticity of the rubber edge on reed & this is too grave to disturb anything or produce inharmonics. The only trouble remaining being the fundamental note of the funnel. By using the new circle tone our funnel & bringing the fundamental up to a very sopra tone in the lowest notes of the piano which are seldom used this defect will be eliminated.

The thing to be done now is to conduct a series of experiments with pianos & cents with some tuned & speed funnel & Reeds phonetic & vary only the leverage of the Reed. Then will determine if its best to get sound Records by having large amplitude to the diaphm & no leverage or Reduce the amplitude of the disc & get the same result by increasing

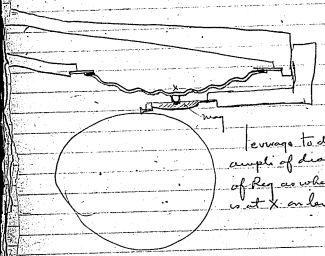
Oct 8 1903 ——

the amplitude of the record knife by leverage of the reed. It a question between the power lost in internal friction of the rubber + the power lost in moving the levers mass + friction of cutting + bending of mechanism + loss by internal friction. Taking all things into consideration I think it will be found that diminishing the amplitude of diaphragm + getting the required movement of the knife by leverage will be better than to have no leverage + increase amplitude of diaphragm to get same result, am not certain of this as concerned in friction of vibration of diaphragm sometimes produces distortions of waves like local echoes in ~~them~~ air close to the disc — If there is a gain in acoustic power this gain can be utilized for getting front faced waves by causing bounce of sound to recede from funnel + then get more natural tone without overfacing loudness —

Start lessons pos on these experiments —

Oct 8 1903

Better use Magnesium for the lever this



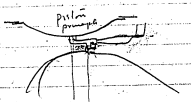
leverage to diminish ampli of diaphr 1/2 of Rey as when knife is at X on lever -

Possibly this whole idea is wrong + there should be negative leverage giving the greatest possible freedom to Diaphr - so it can follow the soundwave -

Freddy Ott made this today but it shows clearly that the cutting work is the main factor + that negative leverage is

Oct 8 1903

the right thing – He changed it so leverage was 1/3 less than of in Center of disc



This gave good results, we kept putting Knife towards fulcrum on lever + using thinner rubber + proved that the right thing is Very thin rubber + negative leverage, the Knife being moved nearer to fulcrum of lever as the thinness of rubber or sensitiveness to deflection increased – the loudness was not diminished but the quality was so much so that I think this piston not flexing diaphr with negative leverage will form an Epoch in the art of phono Recording – I've had to look now as he can make everything accurate –
The Recorder tried was one of the sort made by Hofbauer + the sewing man with French shape + central hinge + no leverage

Oct 8 1903

Alternating Current Rectifier

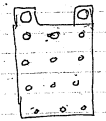
I can't see why a cell containing several hundred thin sheets of raw nickel plated & coated with Ni hydroxide on half plate & Fe reduced by H. like we use — storage but expected cheap. Can't be used for alternating Current rectifier. It should turn it into a decided Current or practically so & be a very practical commercial instrument. Many cells Could be used thus according to Voltage. The Ni Fe Alkalin Storage cell is now reversible — hence, one wave would give say 3.30 Volt & the other wave a very slight reverse voltage.

Work that up. Can use black plate .007 dep & plates & weld with, the Ni hydroxide can be got on by cooking on surface with an acid or other plate by painting or a hydroxide or salt of nickel & reducing by hydrogen — only want but little. $Ni(OH)_2$ & Fe. Can use 35% KOH sol & get low Res — Good —

Could use other things thus Fe & Ni — for work on good voltage but nickel plates are best.

Oct 8 1903

for stiffening possibly should be corrugated —
for separating could be thin mechanically or
lime



1 or continuous rolls, double, acid or alkali
between, — can not use that of separated by
paper punchings might last but is
doubtful in 35 @ 40% —
one defect of roll is it wouldn't carry
heavy current, like plates —
the humbers of cells should be so as
proportional to Voltage as to just recover
small charge so not to make gas on
Reversal

Oct 9 1903

Got from Mine some of the very hard Gualtier pitch + try alone + also doped with various things for Casting Records, test what heat pitch they will stand with weight on them for different times would be a Champion + perhaps the Cotton mention unbreakable Dissolve hardest Blast furnace pitch would answer — if no pitch at mine get in NY or boil down crag pitch to right point until Naphthalene off —

Oct 9. 1903

Make Machine with thread for double shrinkage = twice the pitch of Reg so a Moulded Record will act as Masters after gold plating to form a number of Moulds +

Oct 14 1903

Softening Reg record with 5% of following liquids

Nutmeg oil	Machine Oil
Coal Tar	Sperm oil
Glycerine	Castor oil
Myrbane	Wood Tar oil
Oil Cade	Camphor oil
Oleic acid	Balsam Tolu
Copaiba	
Paraffine oil	Tried the above

today 5% Paraffine oil great, 3% better + well

Oct 14 1903

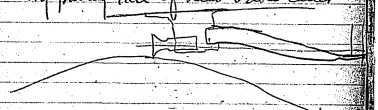
Try following - Rag + 5% Menthol
Camphor Benzaldehyde Chloral + CH3
Pyrolin Prothocatechuic Asphaltoil
Boiled Molasses

Also try all of these oils with Rag
wrap with Carmin left out.

Also Pinz Carmamba with 5 to 10% of
all the oils etc

Also 1/2 Carmamba 1/2 Rag with Carmin
left out + the oily liquids.

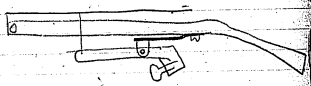
Try a stiffer tail on Reed of piston recorder
Try putting tail of reed below cutter



Oct 14th 1903

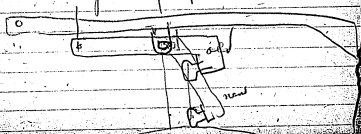
Instead of securing reed by Tail use a bell like the Jan & kept against Hammer by elastic cord etc
Make it by Magnesium Reed

Changes over a Reg Repeater Thus



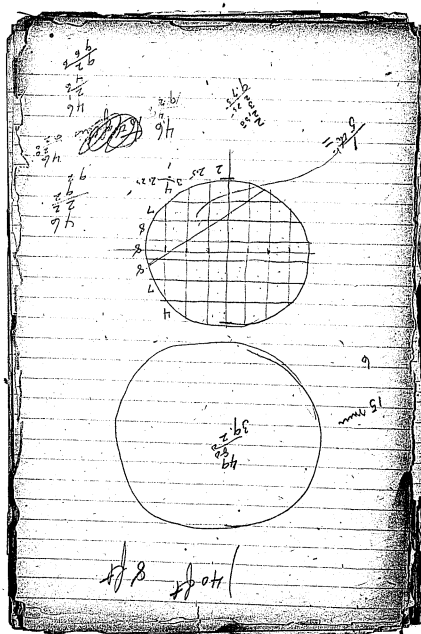
Strong spring to force up going up hill on a deep indentation & prevent jumps of ball & formation & an extra indent by ball itself —

Changes on Reg Repeater Thus



Oct 15 1903.

To prevent repeder ball from running on sides + to get better wear make of Track one thread in advance of Reg. Knife or adjust that so bottom of groove will act as top does now with the groove this will give perfect track



15600 Lab
5980 Kilu Cool.
4550 Eng
260 oil
150 gal
150 Solvent
2600 Solvent
2920

3.680, Merritt,

89c

94 per ton

47000

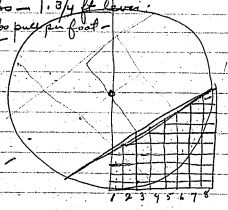
110 ft 8 ft

41 Cont.
18 gallons
12
6
71
76
77

22/400 (18.
18
18
900/2000 (2.2
1800
2000

1.75 ft all the load

1000 lbs — 1.3/4 ft lever.
or 500 lbs pull per foot.
30
1500
3.5



500 3.0
500

1 4.5 40 1240 8. Cubic ft
2 5.75
3 5.5
4 5.75
5 5.75
6 5.50
7 4.75
8 2.00

7 210

0 0 6.2 | 3.5
0.4 | 1.7
5.5
OHL

90 HP

15000
200
3000000
2970000
300
0
365

210 125
8
1000 31500 (90

Christmas Eve 1902

Figures to show 36 plate cell with 1/2 thickness of pockets will permit use of 35% KOH + give just no good watt hours
Capacity per lb + twice the discharge rate
no percent pockets 18 plate 20% KOH

Present.

18 grids 720 grms
9 " 640 " .005 pkts stock for Ni –
9 " 1296 Ni material 6 grms per pkt
9 " 432 pkts .003 for Fe,
9 " 1512 Fe 7 grms –

446) 460.0 (1.031 lbs
446.00
1338
620

20% KOH
35/1000 space, 3 1/2 wide –
900 mah to V. 195 amp at 122
238 Watt hours 17.5 lbs
13.6 Watt hours per lb

54 lbs per HP

Next page

18 · 24 · 3/1.15
40
72

24
72
648

36
36
216
108
1296

24
6
144
9
1296

24
9
216
9
1944

195
122
390
390
195
237) 23790 (100
237
1420
1420

160
125
2) 1290
145

82 –
60
2) 142
71
29
9

65 –
60
17 small

100 –

3.6 –

1.60
180
18
1440
80
3.24

17.5) 238 (13.6
175
63.0
35
280
280
105

36 plate cell —
with Total material of 1st cell put in
1/2 size pocket

Charge Ex 140°

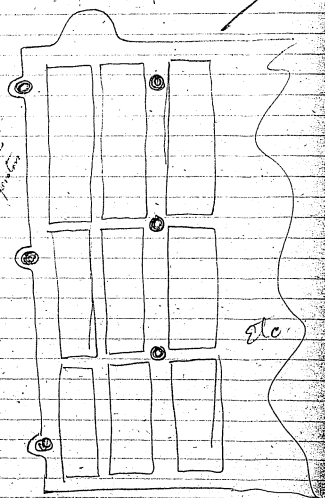
36 grids 1440 grms
36 " 1280 005 pockets
36 " 1296 Ni material
36 " 864 Fe pkts 003
36 " 1512 Fe material
440) 6392 (14.3 lbs.
440
1952
1840
1480
1320

48 lb HPK

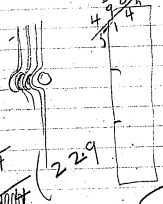
with 35% 1400 to Volt,
302 amp 377.5 watts hour 1400 to V
Estimated weight will increase 3 lbs more
added to the 7 1/2 which makes
24.3 lbs 15.52 watts per lb

The 20% 18 plates giving 13.6 —
This shows a gain + in addition will
give a normal discharge of 60 ~~[illegible]~~
~~[illegible]~~ Amp discharge material of 30
with same economy + probably
discharging much better

Christmas Eve 1902 T.A.E.



514



229

237.
72
474
49
165
170
149
24
24
29
276
29
144
384
384
384
384
1944
23

21
245
21
245
245
490
514

14
21
14
28
294
302
125
300
375
12
18
96
72
216 amp

45
36
90
90
324
288
360
360
72

216
210
216
216
237.

22 ft

144) 250. (

21
11½"

75

150) 500 (3.33.
450
500
500
1 pt.

375
150
2.5 pt.

5

72

75 | 360 | 5

1300

20

20

400

320

30

1728 | 96000 | 8640 | 5

27.7

30c

650

27

27

108

54

64

100

6

15

200

24

300

33 1/3

400

25

20

20

12

360

29

33.1

1300

120

1300

1500

1300

20

26000

39000

270

29

24.1

1500

6 1/3

1500

180

29

15.1

10

30

9000

20

60

18000

40

36000

80

72000

100

90000

200

12

5 | 45 | 125 | 3 | 45

500 | 3 | 2000 | 3000 | 24

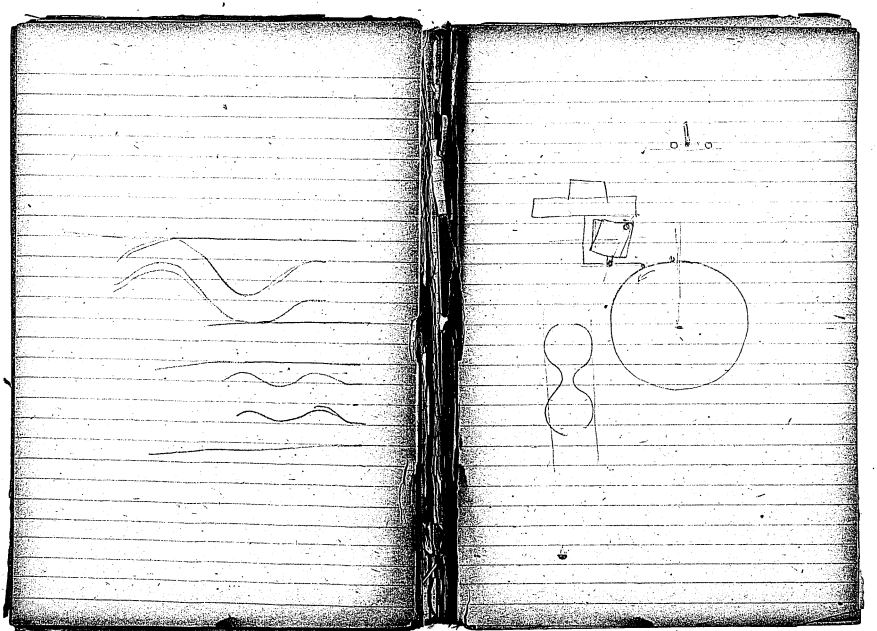
90000

2

29000

61000

41c



7500 lbs —

1 H Discharge 1 Charge

35000 —
10000

45000 =

8 — 40 50 — 3500 —

23 ton 230 — Running 600 starting

35
5
5250
40
210000

12 x 1.
70
50
3500
4400

8 x 4 = 10,215

63360
42240
4 2 7 8 1 0
4 2 6 7 6 1
85 7 6 1

24 acceleration

6 5250
31,6800
190080

9 mm

25 HP Hours
10 acceleration
35 wind
70

75 746
75
3730
5222
5 9 9 5
4 6 8
1 5 9 8
1 4 0 0
1 9 8

200 ft

280
300
24
1500
600
6000

(279

2.5 ft day 2.5 | 6000 (240
500
1000

180 | 450 (2.5
360
900
900
45
60 (180

.5 | 1200
240
120
360
3 6 0

26

31
1200
36200

.15 | 270
1.70
1 3 0
1 3 0

62
3 4
1 2
1 2 4
1 3 6 4

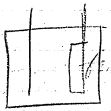
5 | 37200
27440
3720
6
1100
1100
7 6 0

(4

.136 | 2000
1360
6 4 0
5 4

(.15 2.5

25 | 11160 (446
1006
1 1 0
1 0 0
1 5 0



New-y

66 175
66
1050
b) 1050
1155

50 - 210

140.

70 -

150. | 746 (5 -

4.22

60 -

50 -

13.

50 -

565 -

150

4.22

380 -

746

5.6

746

5.75 - | 8.60 | .151

15 mile per HP -

17.8 | 1.54

280 | 17.80 | .635 -

.635

13

21 25

30 — 1200 | 6000 | 50 —

4 80
12 | 2400 | 20 | 715 | 37
2400

25
90
25
3 | 140
45

60 — 30
2400
7 | 210
210
2160

47

160 — 56000 —
90000

3600
43
10800
14400
1548
5644
64
3 | 904

160

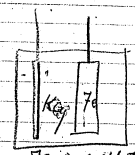
204 | 204

1250
250
6250
6250
2500
1250
56 — 25

620
620
240
20
37
3844

180 | 375 | 2
375
3

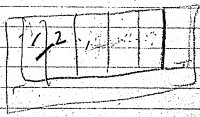
4 times less weight
1/2 the pull in rubber —
pressure same —
with .005 instead .010 Rubber
1/2 the power



Fe_2O_3 sulphate,

Sulf Manganicum

Chyd - Cu - Manganic Sulfate
des Cu O Manganous "



Manganic Manganous sulphate,

Gallic Gallous

26000
26000
26000
26000

7

12000 | 12000 | 12000

Pb Cu

Sulf

60000 | 60000 | 60000 | 60000

Cu

Cu

Cu

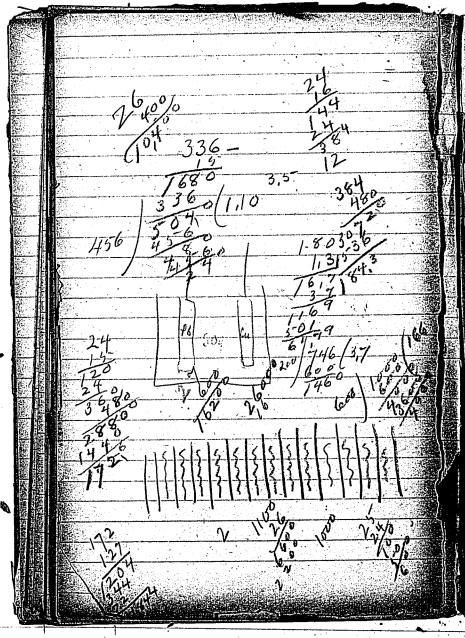
Cu

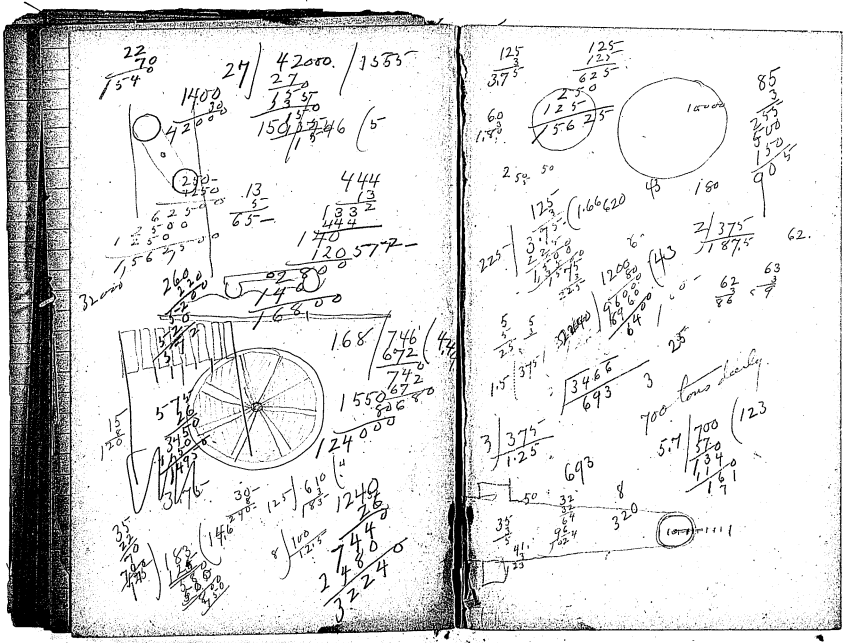
Changed $PbOH_2$ Pb

Chemical chemical

Mg-S-

SO_3 — H

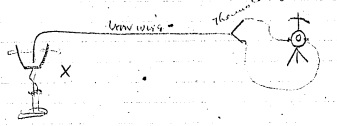




Notebook, N-02-05-01

This notebook was used primarily during May 1902. All entries are by Edison. The book contains notes and drawings that deal mainly with electricity and electromagnetic radiation. Among the entries are items that probably pertain to etheric force and "xyz rays," thermocouples, and the electromotograph. There is also a one-page entry from November 1902 regarding a coal or a gas-fired furnace intended as a combination "stove and light for poor people in Cities." At the end of the book are several rough phonograph drawings. Inserted into the book are two shipping receipts for Mina Miller Edison from July 1903 [not selected]. The pages are unnumbered. Approximately 20 pages have been used.

May 1 - 1902



I notice when wax is poured in bottom dish the bottom of Cover gets warm after few minutes, so rest on hand & water poured on wax to cool quick bottom dish suddenly gets hot,

X Crucible with various Compounds, — Elements melted, — and wire — say 1/4" dia, — 3 ft long immersed in liquid, Thermo pile with opposing quiet Galvanometer and wire of liquid now Chilled showed transmitted or heat waves through the wire, if obtained on 3 ft Vertical wire be far as can try other metals alc also Selenium spread of heat waves — generally unsolved this phenomenon

Iodide of Hexyl acted on by light

I. Mercurous. Exposed to turn yellow then red

Calomel becomes dark gray on exposure to light

Mercurous-Mercuric Iodide decomposed by light

Mercurous oxide decomposed by light, even diffused daylight & surf. perform

Mercuric ox. gradually blackens in sunshine

Tetramethylammonium
Carbonate, turns gray by color
Exposed Light.

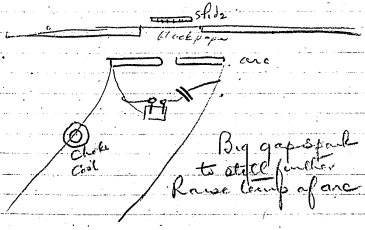
Mercuric Iodallyl Iode
changes color Exposed Light

Mercuric Iodethide readily
decomposed by diffused Light

Phosphate of Methyl
turns gray in Light
Watts 993. 3rd vol

possibly Gymnocephalell
in chloride of Platinum
by Light — test of
Chromic Acid also

also Gelatin surface with Chlorine
also Gelatin surface with Na_2O_3 put on surface
ditto Chromic acid
for Ox Nat Hyposulphite solution
permang K permanganate salts
pbr Comb Cobalt Co_2O_3 —
also Co_2O_3 added only
Peroxide —



Acetylene Either pure or mixed
with other gases sometimes
detonates with chlorine
even in diffused daylight
whether the chlorine and acetylene
is in excess produces tetrachloride

Bromine combines with acetylene
with a violent explosion

Allylene combines in shade
by Br —

Allylene di-bromide turns
brown in light

Good Tetrabromide C_3H_4 I.
Crystals well
very sensitive to light
1st Sup 97 & 98

Benzylene Bromide and -
changes color upon heat

Orthotoluidine Nitrate
Cryst. Green Very light
Lead Lead salt?

Nitrobromoxylene turns
red upon light 1st Sep 29/4

Diamidomesitylene turns red
Exp. to light Cryst. 1st Sep 30

Anthranilic acid or amidobenzoic acid
Lead salt turns yellow upon light

Paranitrobenzoic alcohol
Cryst turns yellow in light

Reversal Double Iodides of Bismuth 1st Sup 348 are quickly altered by light especially Violet rays, surface altering, Bi Iodide also that also

---

Pentoxide Bi good for S Battery, 1st Sup 348

Immune in presence of water

~~A~~ Bismuth light oxides many organic compounds to acids which ~~[illegible]~~ Compounds

Begum ~~[illegible]~~ Talmine Mannite sugar glycerine

Sol of Bleaching powder or pure Calcium hypochlorite give off O in Ohm light,

Not Entered in Photostat

Chrysogen Salt turns
Colorless in light, quickly
1st Sup 4571

Dioxide of Mo MoO_2
produced by fusing
Na Molybdate with Zinc in
Porcelain Crucible, then HCl + Ha
acidulated gives blue crystal
which Conducts Elec

MO is reduced by H to metal
in 3 hours at bright heat
good for Storage Bat
1st Sup - not allied KOH Bichromate

Acid Potassium Vanadate
in Contact with the Oxygen Subs.
turns blue in bright light
See 3rd Sup 1273

Oxalate of Hg. Sens to light
also Reduction

Uranic Nitrate Sens to light

Potassico, Calco Chrome
Oxalate.
Crystals are phenomenal
regarding light made
ably fluorescent
it the most remarkable case of reaction
known

Phosphenyl dibromide liquid
turns yellow in light & decomposes
depositing a red substance,

Barium Salt of Diazosulphanilic
acid when fused at 170 @ 180 C
it becomes so sensitive that it jumps
about the beaker for hours

Benzyl disulfide
Crystals. Exposure to sunshine turns
pink yellow to Red

Ammonium Benzyl Selenate
white Cryst. turns black on
exposure to light not blackened
by heat of water bath.

Cerium Hydrate turns
red when exposed light.

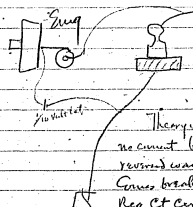
Tetranitro-methyl-methane
turns yellow
Expos. light.

Dioxythymylethylene
Cryst. easily decomposed by light.

Magnesium fluoride by fusion if electrified by Ruhmkorff coil spark then heated glow but not fluorescence

Other fluorides by fusion do same

In addition to the fused salts Hellmann to make sure fuse every simple chemical ~~both~~ organic + inorganic to sure have full list of fluorides, & fuse.



Theory of a low emf no current but when reversed works like Hellmann Gauss breaks down + Reg Ct circuit by (?) instead.

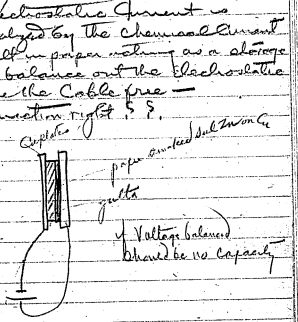
Agents for films on glass for holding sensitive emulsion to light.

Tragacanth, agar agar.
Albumen, Gelatin, Gelatin-albumen
Collodion - ~~[illegible]~~ Paraffine,
Dammar, Varnished Resin
Ammonium tribiphosphate, gelatinous silica,
Silicate Soda, Gum Dextrine
Gum arabic, Potato Starch, Gluten,
Balsam Fir - Rubber, Gutta percha
Balata, Mastic Varnish, Amyl Chloride
Shellac Varnish, Iceland Moss,
fish glue,

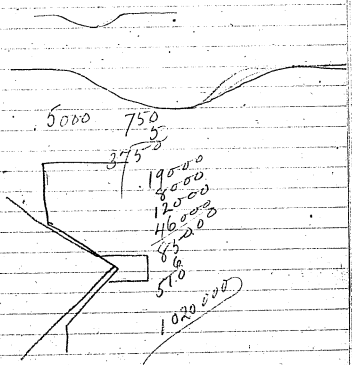
Plates of all the manganic acid salts of silver in gelatine to be made,
Dichromate (impalable), Molybdate, Chromate,
precipitate in situ.

Perhaps its possible to place next to a wire a thin layer of an amorphous material such as a dry metallic sulphate etc & over this lie gutta percha or paper soaked in a solution then a layer of Sny Calloid or tape & then gutta percha. On sending a current, the electrostatic current is neutralized by the chemical current. Use salt in proper mixture as a storage & thus balance out the electrostatic & leave the cable free —

So direction right ? ?.



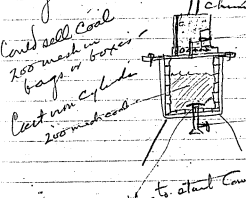
for precise Record Cylinders
I think Organic polymers will
turn out to be the best,


5000
750
5
375
190000
80000
120000
46000
83
6
510
1020000

Nov 1 1902

New idea for a stove for poor people in Cities —

Iron Box lined with fire brick filled with 200 mesh gas or good Bituminous coal



Could probably be used for light using Welsbach Mantle,

fire brick would not be necessary if used for Cooking or warm

16,000
1330
14670

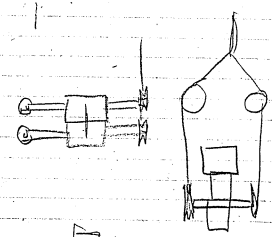
12) 16000 (1330
12
40
36
40
36
4

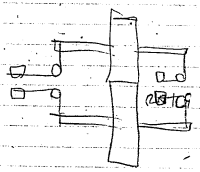
90
415 0000

4000
24000
12
4000
24000
28000

12 16000
11 14670

5000





1 8
5000
9000

5 ft.

125 amp

70 —

75

125
75
625
875
93,75

300
24
1200
60
72

6'

160
7
1120

250 —

93.75
160
5625,00

11 125 amp —

70

135
7
94.5

3) 70
23,3

23 HP —

746) 5625 (7,54
5222
4030
3730
300

6 Hours

240
5200
48000

200

12010

(13,8

318

4

33000) 124800
99000
25800

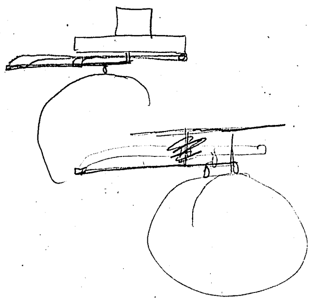
100 Miles

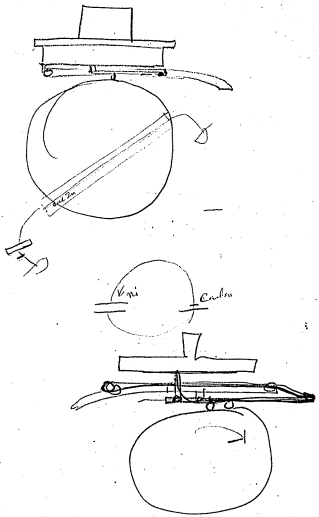
30 $ 30

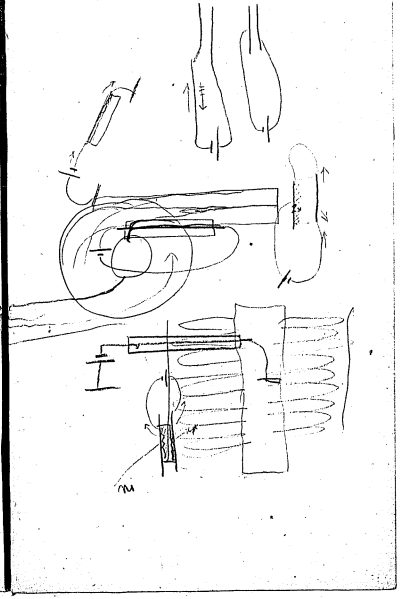
96 —

7 25
7
175

25
8
200




Vari
Carbon

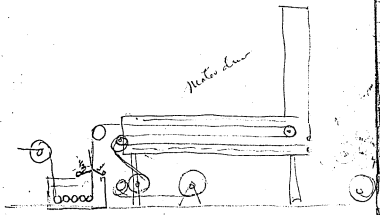


Notebook, N-02-05-04

This notebook contains dated entries from May, October, and December 1902, and November 1903. All entries are by Edison. The book contains notes and drawings regarding chemicals that produce "electric[ity] by friction"; these notes may be related to motograph experiments. Also included are entries pertaining to storage batteries and phonograph recording apparatus, along with several rough phonograph drawings. A marginal notation indicates that some of this material was recopied into an unidentified "big book." The pages are unnumbered. Approximately 70 pages have been used.

Vol I — Read
Vol II "
Vol II "

for Elec by friction



7a2
May 4
1902

Chemicals Electric by friction

Entd by book

Oxalate of Calcium Elec by friction

Berberine white, amorph. powder, Elec by friction

Bucunumanga Resin "

Cinchonidine, pure white powder "

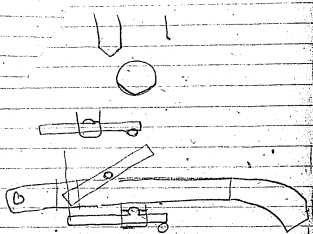
Disacryl white amorp pwdr strongly "

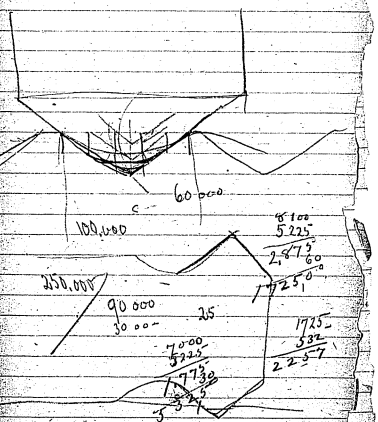
Elemi resin shines in dark when rubbed

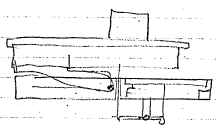
Glycosine. strongly electric by Trituration

Hydrosalicylamide lead salt highly Electric by friction —

Myristone Elect by friction




60 000
100,000
250,000
90 000
30 000
25
5225
2875
60
17250
1725
532
2257
7000
5225
1775
1325
5375



Dec 27 1902 TAE

Have Hetherington, make a phono-master cylinder following — Fused Chloride Silver, Sulphide Silver, Bromide Silver also Sulfide Hg — These can be cast with knife or well poly make good blanks to record on for wax record. The surface of the Ag ones could be reduced to metal by reducing agents + plated on direct without the Vac process —

Also give him book of Albumen Gelatines etc outs + have him make record cylinder by forming + also by dipping in Silver nitr + dry a blank for by Varnish — give Plane Soap as a standard of quality to wk for —

for storage as depolarizer which Mi — use organic Hg capable of oxdtn + reduction with Calcium — Antimony blk does pretty good

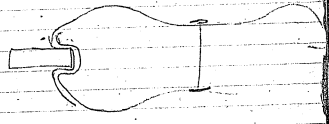
Oxidize by Chlorate K + HCl also
Hypo, The Nitrogenous Hydrocarbon
Especially those having ~~[illegible]~~ Nm
the Benzol nucleus +

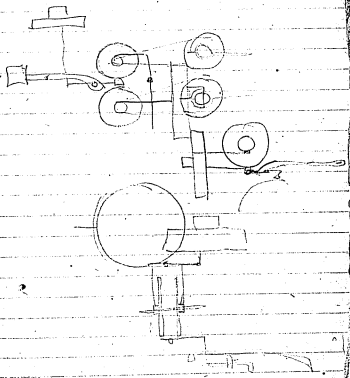
Try Syrian & other high Carbon
Resellum Oxdz by Hypo etc,
& rubbing with graff or fine powder

Try the Molybdates made in
Alkali, especially the
black compounds

Compounds which conduct Electricity

Qty Bat, pkts, Oct 7 1902





Di-strontium ortho phosphate
by prep. Sr Salt by Di Sodium phos
white precipitate, fusing point
is phosphorescent —

Trip sublimation of sublimung chemicals
in magnetic field, also die electric
field — glass bulbs etc, notice phenomena
also in partial vac,
Sublimes, Bichloride — arsenic + antimony
oxide — Carbon tetrachloride
Camphor, Iodine, Alcl — Ferric Salt
Organic Chem, Ulfal, Anthracene,
etc

Salicylic acid — yellow or sepia to light
" Amorphous.

Tartaric acid Crystals, Bromine
Luminous when rubbed in dark
Tartrate

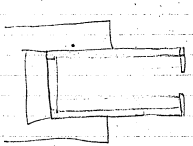
Aluminum Salicylate, gummy
amorphous, due considerable sodium
alloy

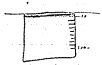
Hydrated Silica precip. from Silica by HCl
dried in Vacuo dissolved in transpt glass
with 23% H2O —

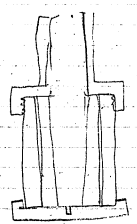
Materials that can be turned bored
etc, for experimenting

Slate, Steatite, Meerschaum, Cryolite
Marble, Gypsum, Mica, Hard Rubber,
Celluloid, Vulcanized fibre, Mixture of
Shellac & clay - Bitten stock, Horn, glue
with powders, Bone, Ivory, Woods,
Lava, Gutta Percha, plaster of paris, Coral,
Oxychloride Magnesia ditto Zinc, Phosphate
Zinc - fused Chlorhydrate Oxychloride lead,
aqsulfide - ferrocyanide - fused [illegible]
Flexible sheets, Mica, Gutta Percha,
Balata, Rubber (hard) — Celluloid,
glue, Gelatin, Gelatin-sugar or syrup,
Collodion, Vulcanized fibre, paper,
Vinegar of wood, Hydracanth fabric,
Oil of silk, Linseed dilended by SCl2 vapor,
Silicate, Silicified, Carbonized paper.
Reduced Collodion Carbonized —
Leather, animal parchment, fish glue film
Oleate Lead, Sulphurized asphalt.

As a new material Cub Strontia pressed in Hydraulic press, with or without binders, could be moulded in shapes or turned and bored,

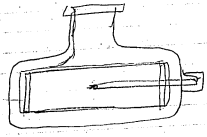






Nov 16 1903 T.A.E. —

Phono Recorders —



Dia glass 1/2" wide 1 1/2 long close fit on header — on knife edge at end oiled knife edge rounded + perfect fit — possibly oil on side of arm drops to close — get no buckles this way

possibly 1/4 long will answer

If the dog has an abominable voice

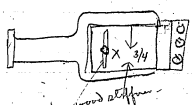
Can make it of 2 Mica .003 each + doped crystals —

115
190
703
200 518
5

3000-

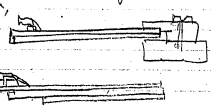
5500
55
55
375
275
302.5
219
27
5886.
152
136
5886

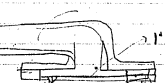
Nov 16 1903 Recd



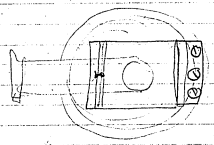
Glass reed with knife on at X
used as dia - close fit .0005

possibly of obectionable note to
Reed use 2 mica of .003 smoke + doped
between,





Nov 16 1903 Reed



Knife

with .0005 ft around Edges total back only Equal to hole area of .023 but on account friction the effect is very much less

Disking a disk is bound to make creeps whereas with a rod this is not the Case

Nov 16 1903 — S Bet.

Evidently some Bismuth hydroxide mixed with Ni hydroxide improves output of butter, gives has some test running on dif percentages both precip'd | together —

6 Cents

5

4

3

2.50

20 +

63

72

4

4 | 7 to 6 lb

1.75 | 1000 (6c

Graple

35

105

6

630

Graple

2229

6693

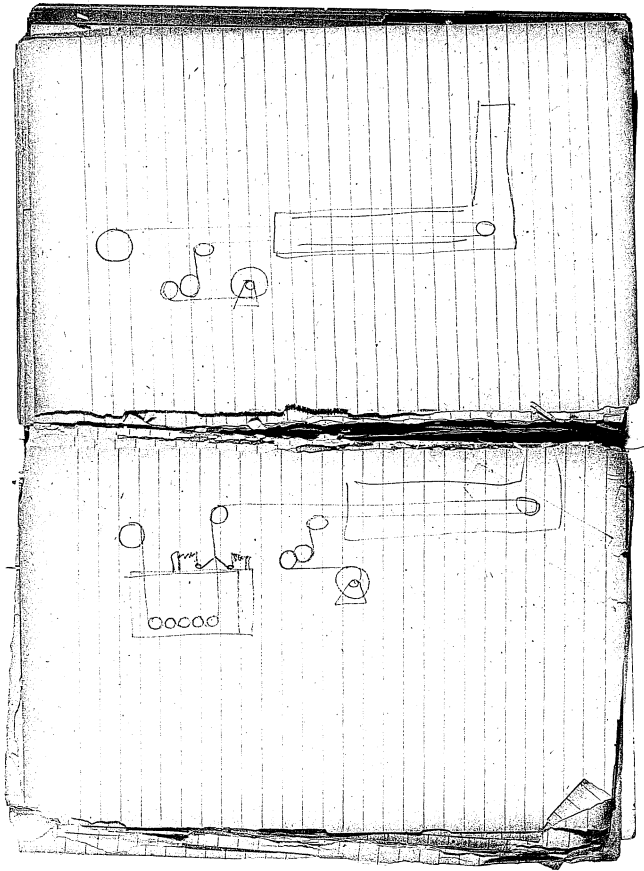
45

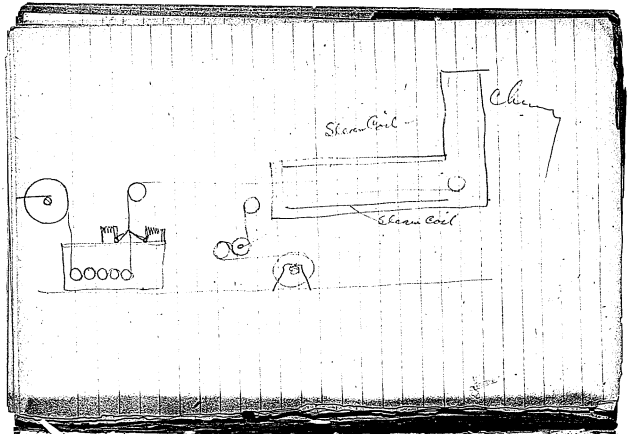
30375

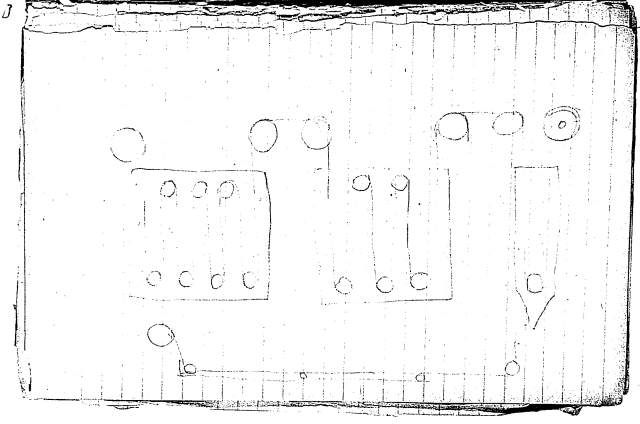
26700

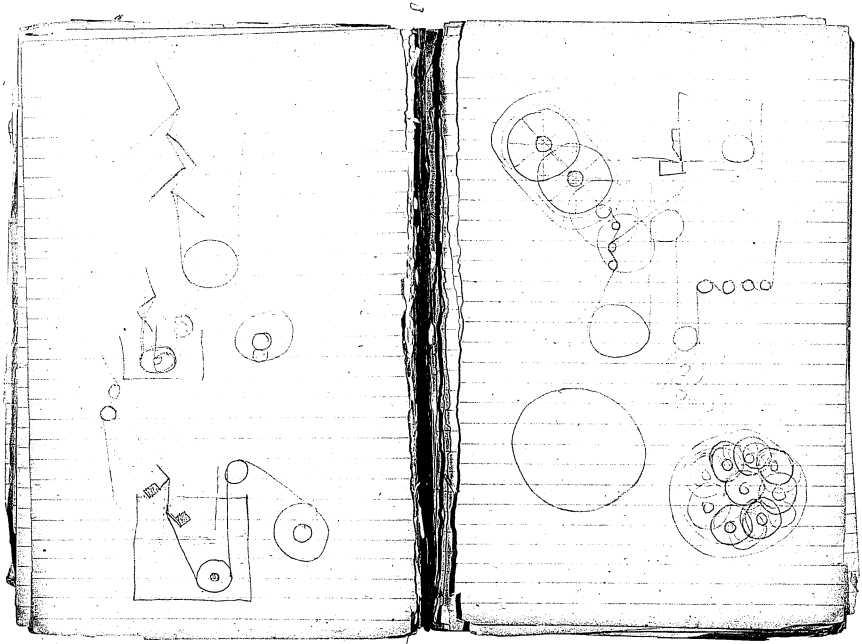
3675

200




Steam Coil
Steam Coil





400. to lb —

10 | 10

2 225
6 675
33375
27000
2 7000

40c

30' - 2 —
10'

40.

1" 1/16 — 100 — 50 —

16 to inch

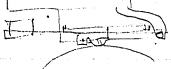
50c

20c

8 18

2 1/2 turned Cast iron

27
162
37
27



7c

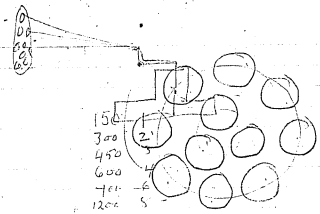
60
48
27.0
2 160
3 240
27 6 Cents —

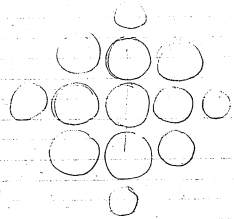
500
32 2
2 7

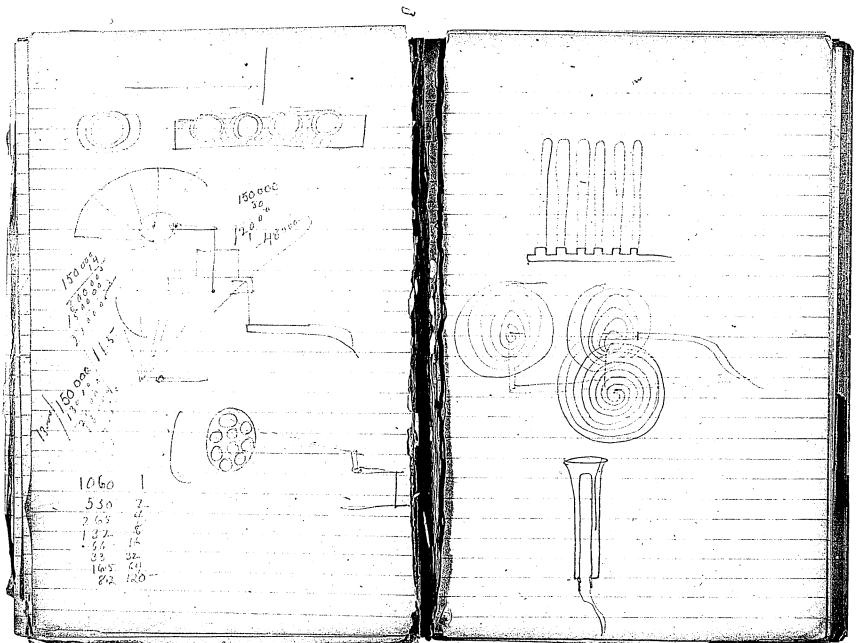
36.+ 28/3 2 28/2

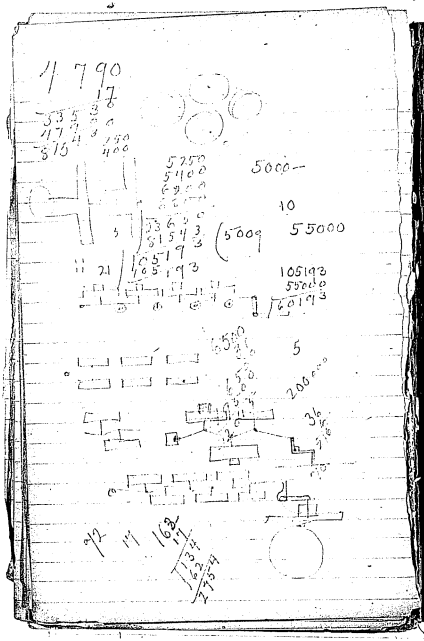
36 — 44 C 36

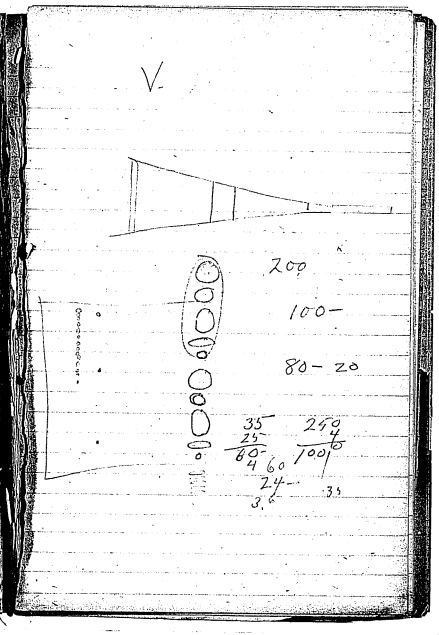
36c to Job — 56 to Retail 44 for gift
14 —

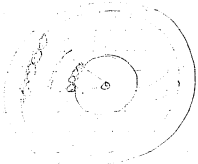




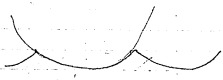

150 000
150 000
150 000
1060 1
530 2
265 4
132 8
66 16
33 32
16.5 64
8.2 128

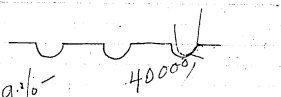

5000
55000
105193
200


V.
200
100
80 - 20



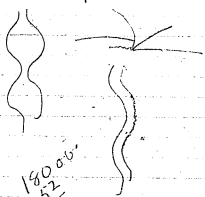
11.5
50
3/6.5



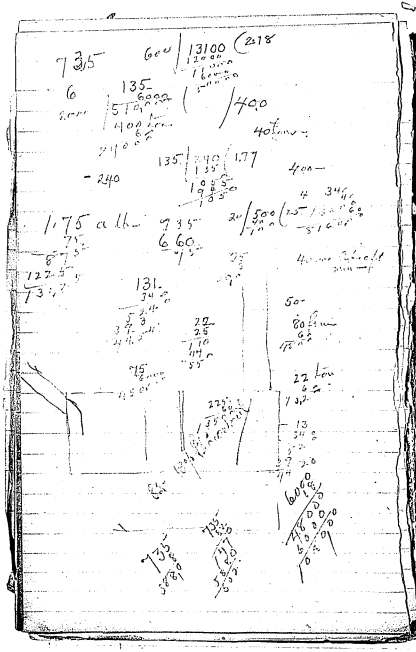


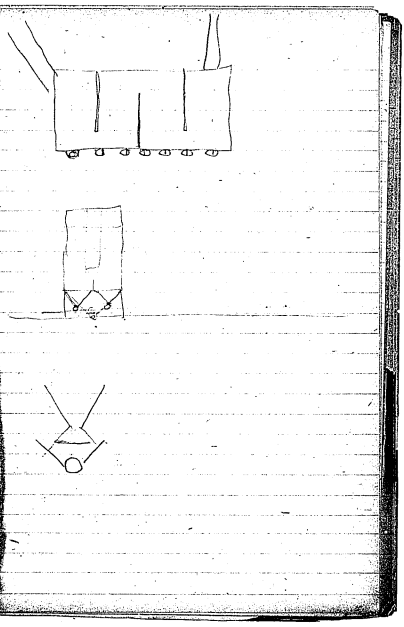
9.2/0

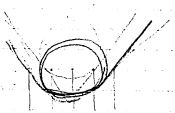
400000

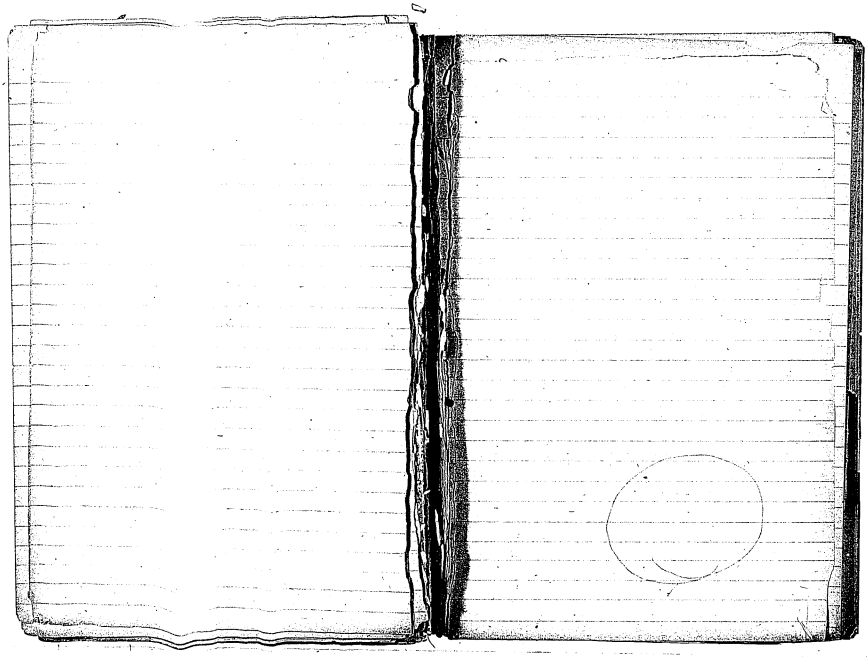


180000
52
360
360
9360000
9/360000

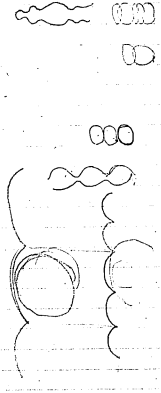








Compounds which blacken, change
Color, decompose in the air



15 tubes / 12 gms.

30

36

1490

650

214

750 ml

2000

N_2O_3

N. hot.

NO_2

N. hot.

15

135

175

240

1335

1125

750

762 | 1200 (1.5

762 | 9000 (1.14

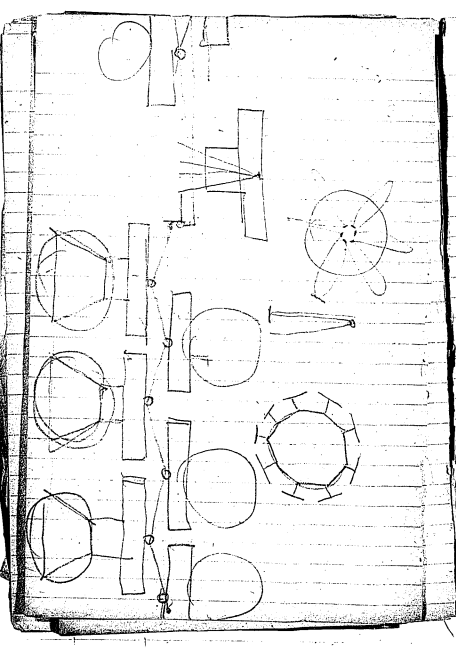
8095

3.75

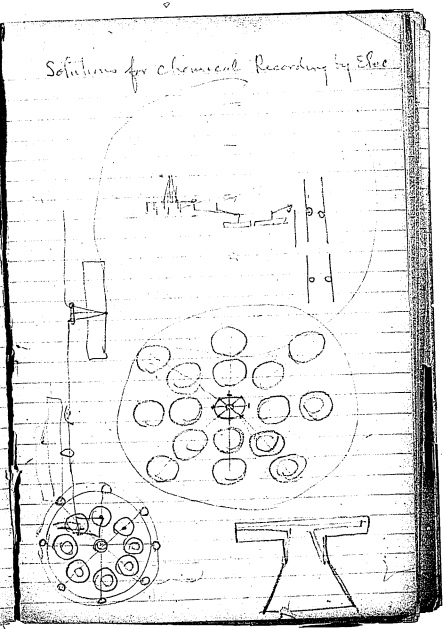
72

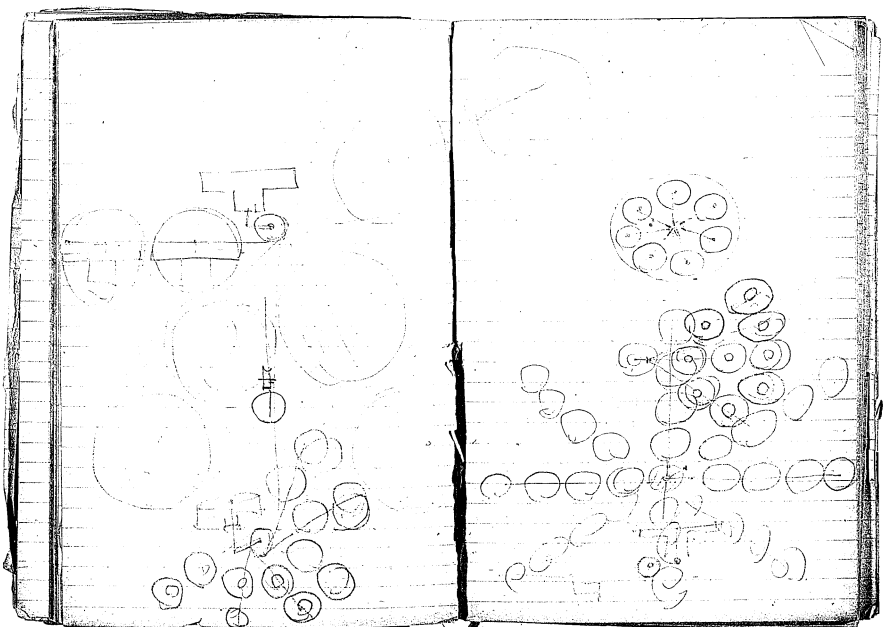
6000 | 270

2000



Solutions for chemical Recording by Elec





75) 3330 (44.4
300
330
300
30

175
21
175
350
3675

1335
21
335
670
670
0

44.400
200

15 grms well dissolves 2 grms HgO
90 " " " 1 grm HgO

175 cc 2 grms diss 5 grms HgO
1335 7.5 grms = 37 mlgs
6 times more HgO. 120 | 222 | 1.8
| 120
| 1020

75

175 cc
10 mlgs HgO
diss 5 mlgs
50 grs
120 tubes
175 | 75
175 times
75
44 lb. grms

175 cc 2 HOCl diss 5 mlgs HgO 1.8 mlgs for 1 tube
1335 or 7½ times liquid diss – 37 mlgs
only enough for 20 tubes –
but if you put 6 times more HOCl
diss 222 mlgs which gives 1.8 mlgs each tube

2 120 | 154 – (1280 –
12 0
3 4 0
2 4 0
1 0 0

There is no material change in Cl content there
is not concentration that is the trouble –
of HgO dissolves in proportion to HOCl or liquid
They might account for it –
poor to per cent of each tube (a great many lb grms

The other thing is that HOCl combines
with the Litmus then holds it

The trouble is in clg it was the clg that
consequently it comes in readily 90% HgO is
well enough so it is what probably
unite the HgO –
The HOCl must combine with the Ni
in clg or dis – of on charges.

111

283 grms KOH A 4
15 " LiOH — "

1000 grms outside liquid between plates — 210 grms KOH.
11.1 " LiOH —

825 grms Metallic Iron —

Required in Fe to reduce 1 grm KOH per gram iron — 215 grms iron required. 215 grms KOH — bottled 73 already in — 142 must come out solution (10 Ry. 1000 ~~gm~~ 210 brings it 142 out. Leaves 1.110 Concentrate 66 grms in Sol — or 6%

Solution of LiOH, after Take part — reduction — Then —

$$\begin{array}{r} 165 \\ \hline 7 \overline{)1155} \\ 1 \quad 20 \\ \hline 4 \overline{)13 \quad 0} \\ 4 \quad 0 \\ \hline 8 \overline{)49} \end{array}$$

1000 grms

17
24 —

Then, of the 210 K 11.1 Li — 1 hundredth Value so it makes 22.2 Li 210 K — the only solid — or 232 — ~~73~~ 142 wanted

$$\begin{array}{r} 232 \\ 142 \\ \hline 90 \end{array}$$

leaves 90 grms outside —
or 9% Solution of which —
90 grms — 0

23/150/6

1000 grms 210 K 11.1 Li
222 units —

Required — 142 units 10 of which — LiOH —
$\frac{142}{270}$ KOH, 14.2 LiOH —

Thus at 1/20 7.1 — LiOH — grms per liter —

2 —	283
	15
4	30
6	45
8	60 grms — 12

283 grms K
60 LiOH —

343 — actual grms

283
120
403 Reduction Value — 295 Rely — 1000
142 Rely

$$\begin{array}{r} 403 \overline{)1350} \\ 1209 \\ \hline 1419 \\ 1209 \\ \hline 210 \end{array} \quad (3.35 \quad \begin{array}{r} 1000.00 \\ 670 \\ \hline 3300 \\ 3115 \\ \hline 1845 \\ 1675 \\ \hline 170 \end{array} \quad (\frac{29}{5}, \frac{53}{}$$

153 in Sol —
15.3% —

283
15
290 / 1500 / 1490 — (5 15

153

1 sqr inch 16.5 qmm

64 (5/4) in inch

1/4 wif 2.50 mif

27 | 446 (16.5
27
16 2
13 5

34 - 88

21 - 6 ,10H.

120 | 1100 (916
1080
20
120
5 0

4 | 916
229
687

120 | 840 (700
4 | 700
175
3 2 5

15
60 | 446 (7.4
3 | 5 0
5

9 | 446 (49.5
36 6
8 5 0

15 | 7 4 | 1 2 0 0 (17
3 4 0
5

1 0 mm

1 3 3 5
1 3 3
3 4 0
3 4 0

1 2 5
1 2 5
0

21.00
1 1 1 1 1 60
2 2 1 1
2 3 2 2 2
2 4 3 1 1 3
2 5 4 1 1 4
2 6 5 1 1 5
2 7 6 1 1 6
2 8 7 1 1 7
2 9 8 1 1 8
3 0 9 1 1 9
2 9 7 2

120 | 15000 (125
120
3 0 0
3 0 0
0

2 9 7 2

160
5200
32000
8000
832000
41600000
83200000
124800000
48000000
62.4 HP

150 5240 00 / 1 hour
3

150

15 lbs

150 10 ton 150 lbs

45 52400 160
450

55 Rocky rate 5240
4

45 | 300 (
50
50 | 800 (6 hours

746 | 118000 (158
746
4340
373
6160
5960

3 | 158
52

13 | 62.4 HP 16 hours 10 miles hour 150 lbs
21

50 watts ton mile 10 tons 500 watts

83 160 miles
500
80000 (107

746 | 80000
7460
5422
3422

800 watt 35

160
3000 (6 83
746 | 7800
160
3000
5960

10 Ton 750 watts per mile —
16 Hours 8 miles hour —
128 miles daily —
A 6 - 240 cells - 64800 watts.
4 charges of 1 hour each of
200 amp hour -

240 cells A.6 — 280 watts · 67200 watts,
out 3 in 1 (18) 12 hours out 4 1 hchg
+ all night — Charge at 50 amp in the
hour 200 amp in 85% effing: 212 watts
in the 4 chgs in 1 hr each — 50880 watts
total. 118080 which in 12 hours gives
9840 watts per hour - of speed 18 miles hour
+ 85 watts mile per ton 10 tons · 850 watts
per hour miles - gives 8500 watts per hour
9840 available + 8 hours at night
for full all purposes —

50 mlg	379	— 36 —	41 amp
100 mlg	343	95 +	52
200	438	73 +	61
400	511	43	66.4
700	554	23	81.4
1000	677	106	94
2 [illegible]	783	— 314 —	131.7
3 [illegible]	1098		

4)1341 (1341

120)161000

4)1098

677

120)129000 (1070

4)1070

1335

1098

1335 Redundant

3)113 6
379

3)23 5 9
783

3)153 4
511

3)103 0
343

3)166 2
554

3)131 3
438

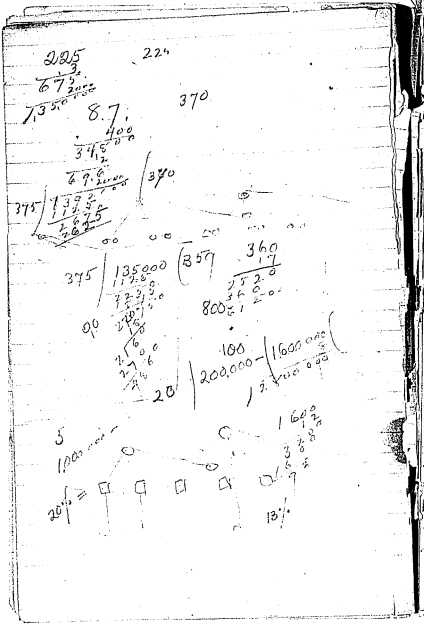
3)20 3 0
677

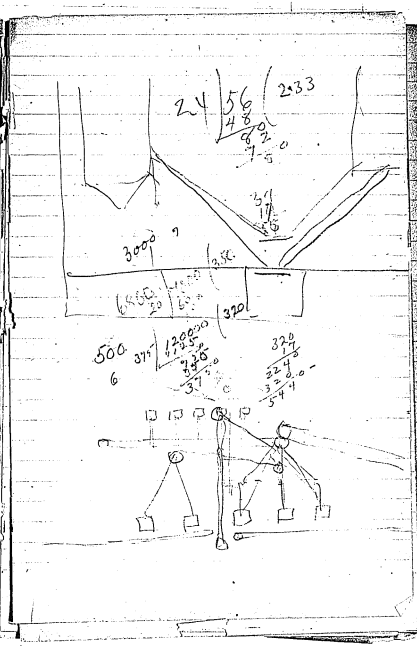
3)32 9 3
1098

330
299

5)1335

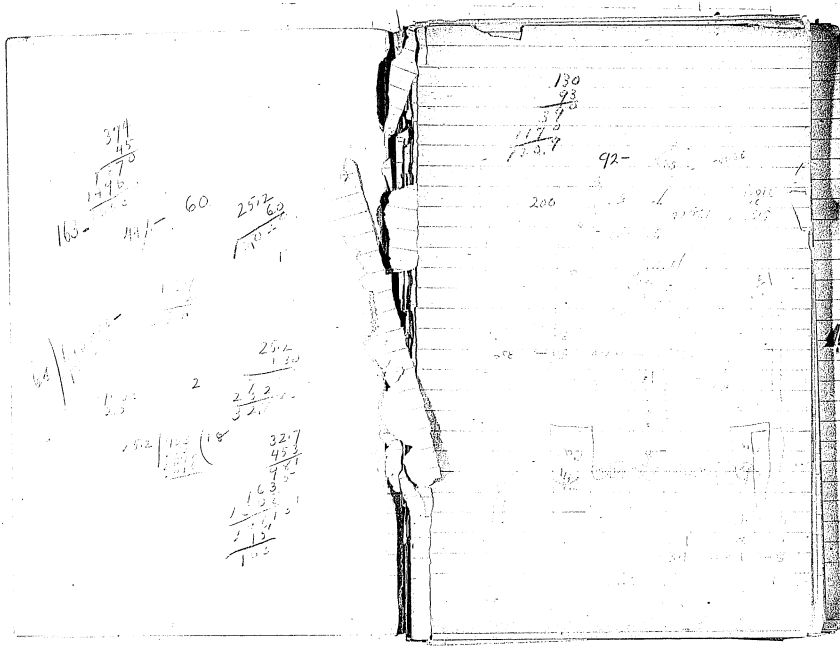
16)209 (13





900	156
950	164
1000	173
1050	182
1100	190
1150	198
1200	206
1250	214
1300	222
1350	230
1400	238

1000	160
1050	168
1100	176
1150	184
1200	192
1250	200
1300	208
1350	216

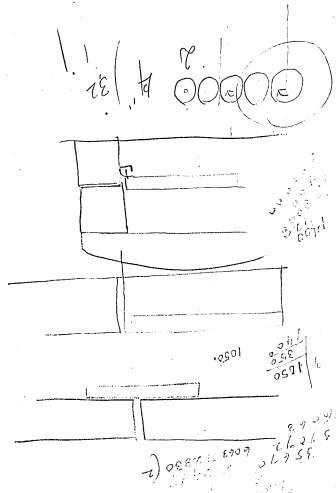


60
130 fin Radiation

1.7 lbs 150 deg to 140 deg
gal 5 times 12 = 60 lbs 30 deg to 90 #

17 lbs water 150 deg HP#
.3 HP Circulation pump 1 cut -
5 Engineer

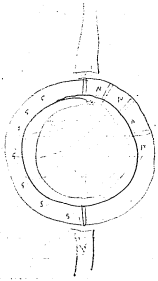
17 lbs 62 to 212
1 HP Hour

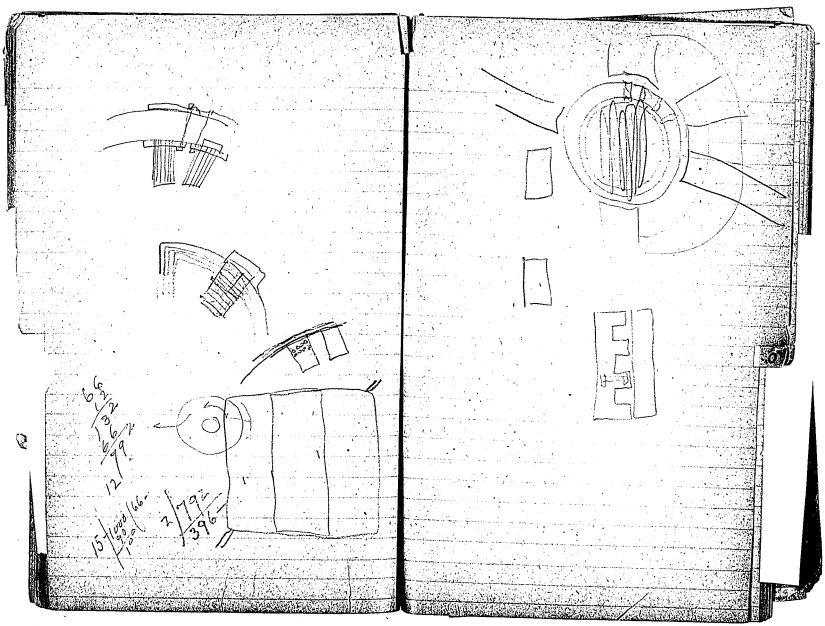


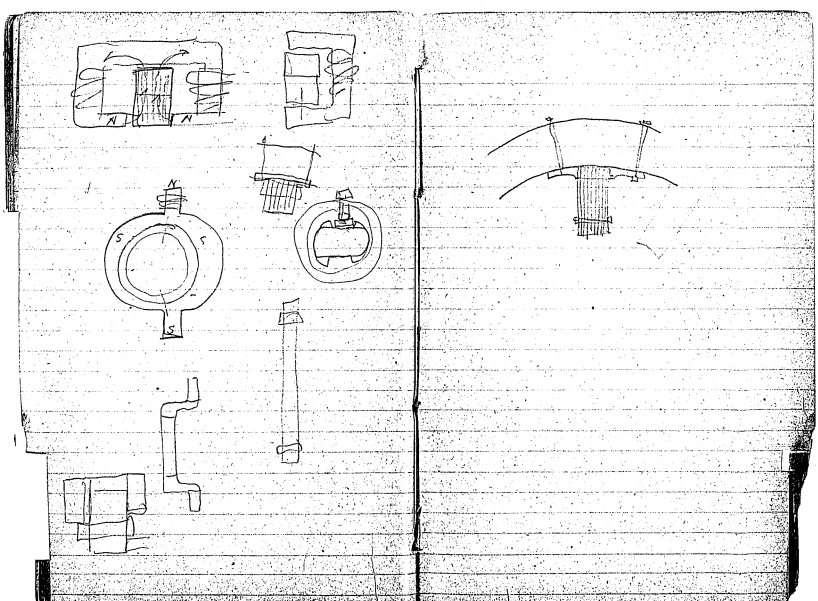
Notebook, N-02-08-00

The only dated entry in this notebook is from August 1902. At the beginning of the book is an incomplete inventory by Ludwig F. Ott of chemicals in the stock room at the West Orange laboratory [not selected]. Scattered among the blank pages in the remainder of the book are drawings by Edison regarding an unidentified electrical or electromagnetic technology. The pages are unnumbered. Approximately 20 pages have been used.

S
N


M
V
E
P
S
N




N
N
N
S
S
S

Notebook, N-02-02-16

This undated notebook was used by Edison, possibly in 1902. It contains lists of chemical compounds intended for an unspecified project, possibly thermocouple or etheric force experiments. The pages are unnumbered. Approximately 30 pages have been used.

Examined & Filed Pa
No 3 26

Sumpatate of Soda 4 grammes
Sulphide Lime, 1/4 1/2 1 2 + 4 gms
Sulphide Potash " "
Sulphide Strontia, " "
Sulphide Barium " "
Sulphide Zinc,
Sulphide Magnesium
Sulphide Aluminum
Sulphide Lithia

Impotable Lime } 4 gr

Sulphide Potash ¼ ½ 1 2 & 4 grms

Sulphide Lime, "

Sulphide Strontia "

Sulphide Barium "

Sulphide Zinc "

Sulphide Magnesium "

Sulphide Aluminum "

Sulphide Lithia

Tungstate Lime 4 grms

Thorium Oxide, $\frac{1}{4}$ $\frac{1}{2}$ 1 2 + 4 grms

Tungstic acid 4 grms

Thorium Oxide $\frac{1}{4}$ $\frac{1}{2}$ 1 2 + 4 grms

Silicate Lime 4 alone

Silicate Lime 4 grms

Tungstate Soda	$\frac{1}{4}$	$\frac{1}{2}$	1	2 & 4 grms
Tungstate Lime	"			"
Tungstate Strontia	"			"
Tungstate Barium	"			"

Silicate Lime, 4 grms

Sulphide Lime	$\frac{1}{4}$	$\frac{1}{2}$	1	2 & 3 grms
Sulphide Barium				"
Sulphide Strontia				"
Sulphide Zinc,				"
Sulphide Lithia				"
Oxide Thorina				"

Silicate Zinc 4 grms &

Silicate Lime ¼ ½ 1 2 & 4 grms
" Tin "
" Bismuth "
" Lead "
" Iron
" Cobalt "
" Nickel
" Antimony
" Strontia
" Baryta "
" Alumina
" Magnesia
" Copper "
" Manganese
Zinc
Cadmium

Silicate Barium 4 grms

Silicate	Lime	¼	½	1	2 4 4 grms
"	Jm				"
"	Bi				
"	Pb				
"	Fe				"
"	Co				
"	Ni				"
"	Sb				
"	Sr				
"	Ba				"
"	Al				
"	Mg				"
"	Cu				
"	Mn				"
"	Ur				
"	W				"
"	Mo				"
"	Cr				"
	Zn				
	Cd				

Silicate Strontia 4 grms
and
Silicate Tin ¼ ½ 1 2 & 4 grms
Bi
Pb
Fe
Co
Ni
Sb
Sr
Ba
Al
Mg
Cu
Mn
Ur
Mo
W
Cr
Li
K
Na
Zn
Cd

Fluoride Lime 4 grms

Sulphide: Sn	¼	½	1	2 & 4 grms
Pb				
Fe				
Co				
Ni				
Sb				
Sr				
Ba				
Al				
Mg				
Cu				
Mn				
Ur				
Mo				
W				
Cr				
Li				
K				
Na				
Bi				
Zn				
Cd				

Fluoride Lime 4 grms

Fluoride		¼	½	1	2 to 4 grms
	Pb				
	Fe				
	Co				
	Ni				
	Sb				
	Sr				
	Ba				
	Al				
	Mg				
	Cu				
	Mn				
	Ur				
	Mo				
	W				
	Ai				
	K				
	Na				
	Bi				
	Zn				
	Cd				

Sulphate of Tin 4 grms ✓

Sulphate of	Pb	¼	½	1	2 & 4 grms
"	Fe				
	Co				
	Ni				
	Sb				
	Sr				
	Ba				
	Al				
	Mg				
	Cu				
	Mn				
	Ur				
	Mo				
	Li				
	Na				
	Ca				
	Cr				
	Bi				
	Zn				
	Cd				

Sulphate of Lead 4 grms

Sulphate of Fe 4 ½ 1 2+4 grs

Co

Ni

Sb

Sr

Ba

Al

Mg

Cu

Mn

Ur

Mo

Li

Na

Ca

Cr

Zn

Cd

Sulphate Fe 4 grms +

Sulphate Co
Sb
Ni
Sr
Ca
Ba
Al
Mg
Cu
Mn
Ur
Mo
Al
Na
Cr
Zn
Cd

Sulphate of Nickel 4 grms

Sulphate of Co
Sr
Ca
Ba
al
Mg
Cu
Mn
Ur
Mo
Cr
Li
Na
Bi
Sb
Fe
Zn
Cd

Sulphate Cobalt 4 grms &

Sulphate.					
	Sr	$\frac{1}{4}$	$\frac{1}{2}$	1	2 & 4 grm
	Ca				
	Ba				
	Al				
	Mg				
	Cu				
	Mn				
	Ur				
	Mo				
	Cr				
	Li				
	Na				
	Bi				
	Sb				
	Zn				
	Cd				

Sulphate Lime 4 grms +

Sulphate.				
	Sr	4.5	1	2+4
	Ba			
	Al			
	Mg			
	Cu			
	Mn			
	Ur			
	Mo			
	Cy			
	Li			
	Na			
	Bi			
	Sb			
	Zn			
	Cd			

Sulphate Barium 4 grms &

Sulphate of Mg ¼ ½ 1 2 & 4 grms

Al

Mg

Cu

Mn

W

Mo

Cr

Li

Na

Bi

Sb

Zn

Cd

Sulphate Aluminum 4 grms

Sulphate	Mg	1/7	1/2	1	2	4
	Cu					
	Mn					
	Ur					
	Mo					
	Cr					
	Li					
	Na					
	Bi					
	Sb					
	Zn					
	Cd					

Sulphate Magnesium 4 grms. &

Sulphate Cu $\frac{1}{4}$ $\frac{1}{2}$ 1 2 & 4

Mn

Ur

Mo

Cr

Al

Na

Bi

Sb

Zn

Cd

Sulphate Manganese 4 grms &

Sulphate	Ur	¼	½	1	2 + 4
	Mo				
1	Cr			1	
	Li				
1	Na			1	
	Bi				
1	Sb			1	
	Zn				
1	Ca				

Sulphate Uranium 4 grms &

Sulphate	No	$\frac{1}{4}$	$\frac{1}{2}$	1	2	4
	Cr					
	Li					
	Na					
	Bi					
	Sb					
	Zn					
	Cd					

Sulphate Chromum 4 grms &

Sulphate	Li	¼	½	1	2 & 4
	Na			1	
1	Bi				
1	Sb			1	
1	Zn				
1	Ca			1	

Sulphate Lithia 4 grms

Sulphate Na	$\frac{1}{4}$	$\frac{1}{2}$	1	2	4
Bi					
Sb				1	
Zn				1	
Cu				1	

Sulphate Soda 4 grms &

Sulfate	Bi	$\frac{1}{4}$	$\frac{1}{2}$	1	2 & 4
	Sb				
	Zn				
	Cd				

Sulphate Bismuth 4 grms

Sulphate	Sb	$\frac{1}{4}$	$\frac{1}{2}$	1	2	4
	Zn					
	Cd					

Sulphate Zinc 4 grms &
Sulphate Cd $\frac{1}{4}$ $\frac{1}{2}$ 1 2 & 4

Phosphate Lithea 4 grms

Phos Uranium 4 grms

Phos Zincum "

Phos Barium "

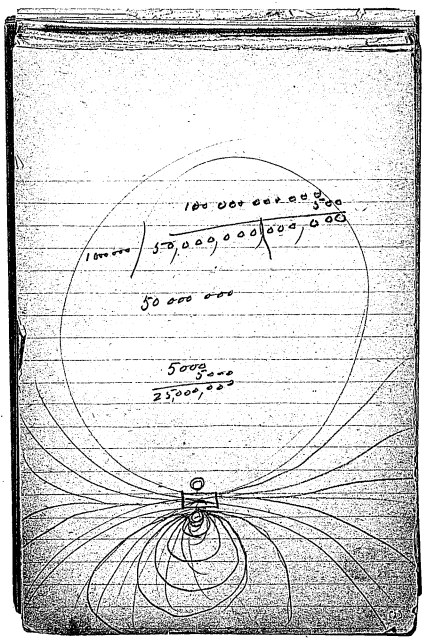
Phos Strontium "

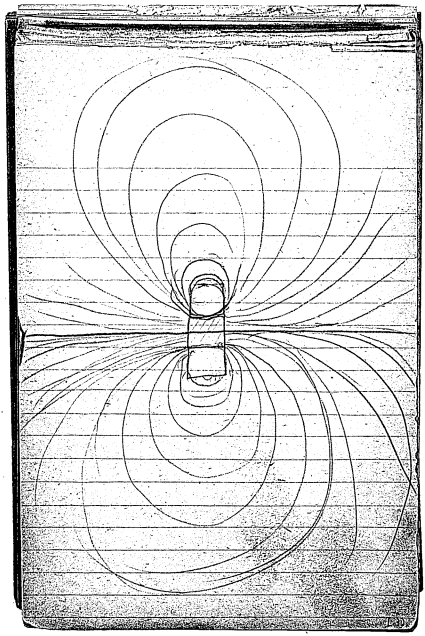
Arsenite Barium "

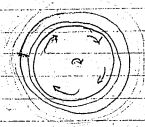
Borate of Zinc "

Notebook, N-99-00-00.2

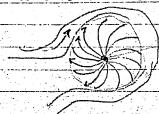
This undated non-standard-size notebook was used by Edison, possibly in 1902 or 1903. It contains notes and drawings regarding electrical theory and the reaction of metals in electrical fields. The entries may relate to Edison's experiments with x-rays, etheric force, and "xyz rays." The pages are unnumbered, and several pages have been removed from the book. Approximately 90 pages have been used.


100 000 000 000 5000
100000 | 50,000,000,000,000
50 000 000
5000 5000
25,000,000





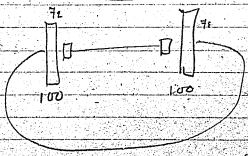
passage of Current twists the
nerve strands to twist the Exterior



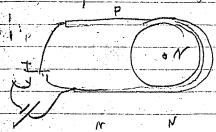
until they get to some thing
opposed the waves passage
longitudinally with the
wave

Act like a Storage battery
which is charging

Fe
Fe
Fe
Fe
NiO2
Ox Metal
Ox
Ox
Ni OH
Fe metal
Fe

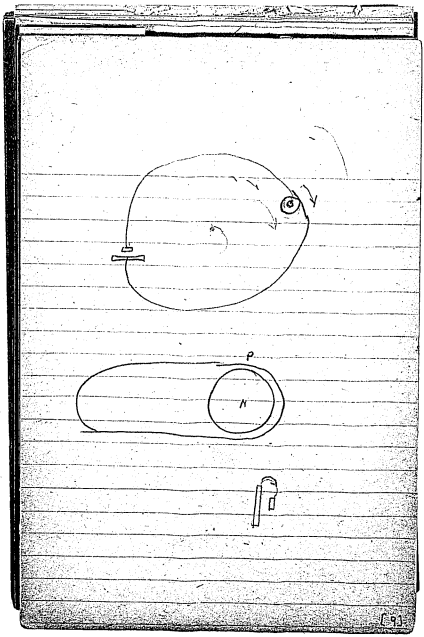

Fe
Fe
100
100

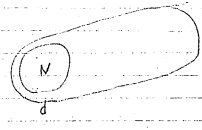
It acts like a fly wheel
with no friction but considerable inertia.



If battery, & shunt have a tendency to change + then gives off heat correspondingly to its voltage —
then when a discon it would give current in r. & heat dissipation + sends it down.

P
N


P
N


V
d

It looks as if the wire was
charged by the Iron & —
& when the Current was taken
off — it discharged thru the
Either = Iron & when Negative
Connects with the Other —
Its only one pole where we
have to do with Contacts,

There may be some other
way it can discharge +
good Currents into the
Connects, but its pretty certain
that it is charged Negative,
or Corresponds to the Zinc of
a battery
& if connected as a single battery
it acts as if it was discharged
then fully charged then reversed
~~[illegible]~~ + discharges reversed
in other words like a fly wheel
it first appears starting by inertia after
its to apply resistance [illegible]

If you put a little ~~[illegible]~~
drop in wire around it,
then when battery disconnected
it keeps on a finitely stopping its
motion from having a current in
same direction as battery current.

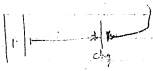
If it were compression, its
compression would act against
current & be liable to give
current in opposite direction.

If it rotates (as the machine)
clockwise a clockwise current
then would require that all
the machines of a government
magnet rotated for ever
This cant be so.

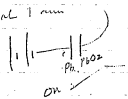
If it twisted the molecules in the direction of the Current then going back would give current in wrong direction,

If they are attracted by the Current then the Xtn Current would be OK —

If a magnet was made of Gunpowder compressed very fine — and wound with very fine wire over which was a shell of metal such thick of Copper — if Copper current broken — now changed to Aluminium + then Copper shell Cut and the discharge instead of being instantaneous without Copper shell would now take Several minutes, there would be due to Current in the Copper but the total Energy would be



1 VAL 1 mm



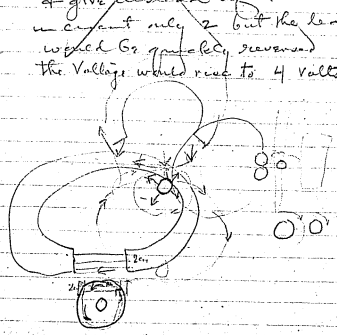
No more that depending upon the energy of the original stream, then by having Copper sheet covering the magnet entirely the magnet + coil and Earth for circuit + giving no extra Current for short periods -

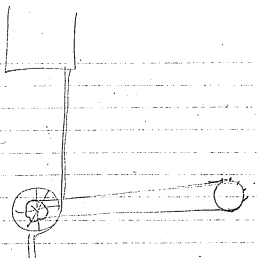
Eddy currents only delays, but does not add or change to the ~~transform~~ the energy required for each piece of fol on the iron is connected.

There must be mutual attraction but the moving Current, this would require work to be done on the magnet to oppose the Current + when Current ceased the action would be in the same direction.

~~Now also~~

If we had 2 Cells and another Cell which was a Lead Battery - ~~Cell~~ of very low capacity, & fully charged on closing the Current it would oppose the two cells & give a voltage of 4 volts in current only 2 but the lead would be quickly reversed the Voltage would rise to 4 volts.





Perhaps the molecules or Cryptogals
of iron are so arranged that
when Current passes they are
twisted ½ way round giving number
& when Current off the gas
the other part of the revolution
gives out energy in the same
direction

20000 ft 1

27/390,000/20,00 1

204 1 ft ½

1.00 .96

1".4 Mile - 1 ft -

.0001

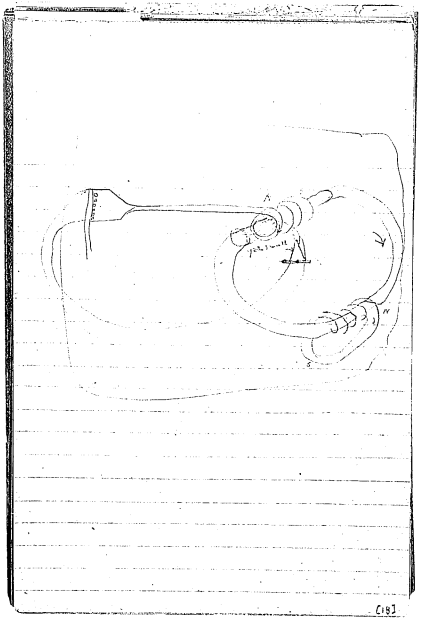
[15]

The wind gives explanation
of motion and black prevents
it. Current was some development

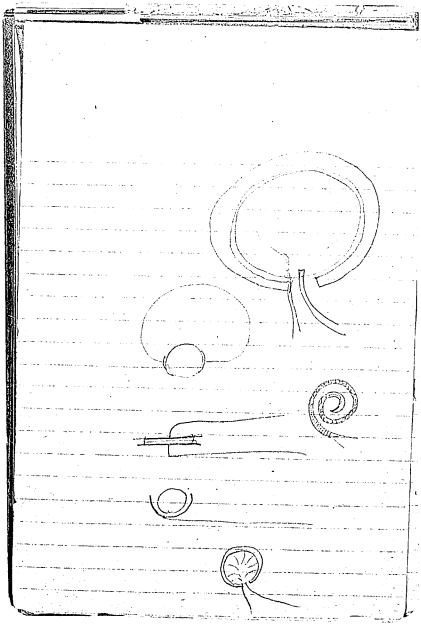
Each mall cube making a
complete rev on each
closing & opening of the
circuit, it makes a
half rev & every alternate
is running in opposite

The wm is now hanging
loz have a mag at
if a current of steel is magd
it gives 1/2 lower & can't
get back yet I don't see
how it got 1/2 rev
when closed by hand only
it cannot get back, because

Probably it required Energy
to force it around hard
against the hardness &
Rigidity Energy Energy to
get back a Knock
will sometimes do it
or it seems a strange Rule a
Knock should always
compare current theory
it looks more like crystalline
precipitation or coagulation —
not molecular —
like fluorescence or phosphorescence


A
N

Camp
Our Camp
Headwaters of the Yukon
Coalwater
Set from Water course
the line marked of
Longitude & lat. was



If the dia of Diabetes lead to increase + length demands then it will r of pend & provide to meet which dual demands & length increase —

The atomic pith is ~~oblong~~ curvation + made oblong ~~[illegible]~~ + Diabetes oblong + set the other way —

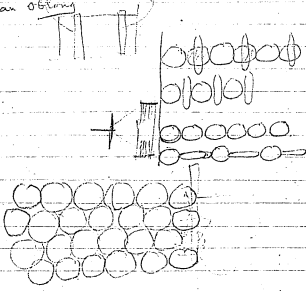
~~[illegible]~~ - Why does not set one way because composed of one kind ions + complex — Diabetes have 2 kinds ions — but how about sulphur phos, Bi —

With Iron there is hardening to form Oxygen in equilibrium with Endothermic and Exothermic

With deastetic hardening

to decomposition of oxygen by [illegible] Endothermic [illegible] further

either destroy the tangent of [illegible] movements to an oblong



Suppose we say that the aggregates of iron have their atoms orbits under elliptic and aggregates of Diamagnetism also elliptic but under very small in orbits parallel with the iron form of the orbits the opposite –

or the stress of cohesion in iron is directive, by the magnet and that Diamagnetism also but the cohesion stress takes place in an opposite direction?

Diabodies ~~[illegible]~~ ~~their shape [illegible]~~ ~~[illegible]~~ tend to form a plate or parabodies a wire –

Both are non compressible – but flow without change of their volumes –

One is a compound tendency to decompose into an element " to combine – Combine with what, with itself probably each having an orbit 2 orbits combine to make an ellipse or less n atoms

Perhaps aggregates of them are separate with equally stressed boundaries

Yet under the influence of the
waves front the stress in the 90
or additional stress is applied to
distort the crystals in instances
belonging to
In the case of the diamagnetic
the stress is unequal on the
Crystal being a uniaxial aggregate
hence the waves front makes an
tends to make it separative.

(3) The diamagnetics in magnetic
all aggregates
or they may have crystalline structure
so waves front tends to tilt them
in longest direction so as to
be parallel with waves
whereas with iron the crystal
is symmetrical & must altering

This is very likely with iron
as to some extent distortions
are compound

Now why dont copper do
the same thing –
The reason is that it dont
form a magnetic aggregate
but is like a diamagnetic
with the bar but has
no stress in the aggregate
(12) among them acted –

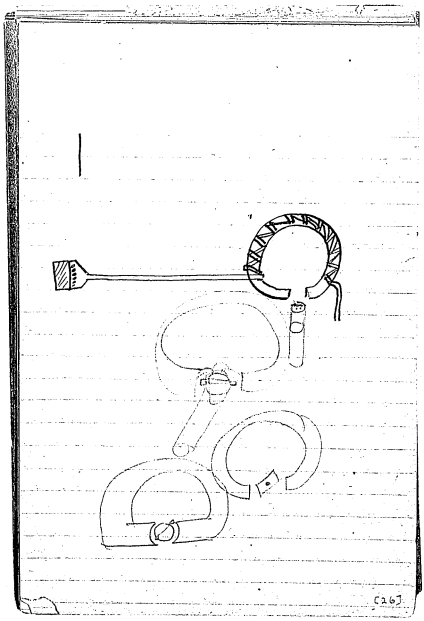
The changing of the magnetism
in a piece of mag by kindness
would show that the phenomena
is not atomic or molecular
but very much coarser – (12)
Crystalline + Cohesive forces of the
aggregated crystals, although
this wont explain a powdering
Metals or crystals gives light
better assume molecular
+ Cohesive of Molecular aggregate

Dr. Hall's Hemp tobacco, Mr. Lake's Crystals
in Cubic or symmetric Systems —

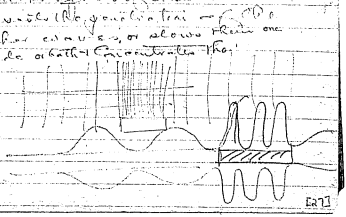
I wishing a Cube may for various
reasons go to a flat position,
also that impurities should not
have entered in the crystal and
destroy it.

When we consider how good fertilizers
have run for X ray the last
2 years, 1 year bad and may have
3 probably 5 in a period of
1 good or other years poor
of Bofcalay, Jerusalem Artichokes
3 for X — Earth Sulfides etc
for Sugar cane — Oxalic acid
for Cl Cl Cl, It not the
unprodeuts but the Crystalum
Others that does it — They grow
poor by usage

[095]


[267]

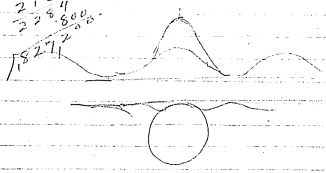
By alternating current of a ~~mag~~ general
Consider
hundred times second we may have the
Consulting Engineer of the new ~~theatre~~
then speculations that the new organs
or Cathedrals these are "Cold Comme
for such rapidly - so generally and
probably the Cathedral Pauses measures
with the alternations upto a million
or more - so that the ~~mag~~ new
Council not synchronize Congress
at once - although the alternations of
Council follows then or anyspeed
It looks ~~off~~ as if that the new
Invisible vibrations of the
Elbow exhausts or allows there one
side or both Circumstances they



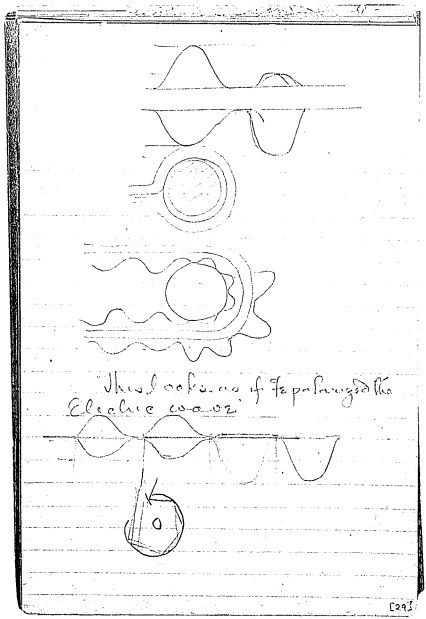
E273

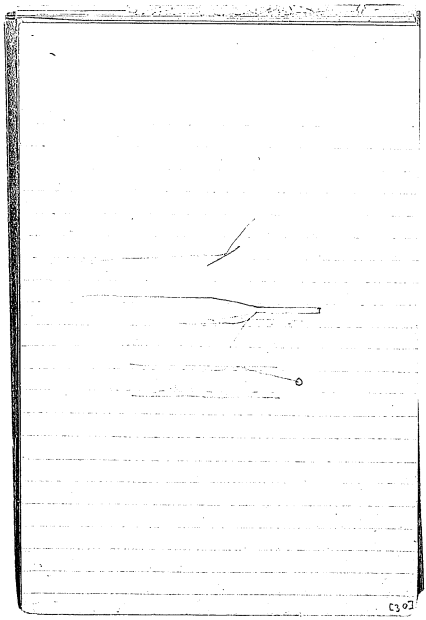
24 — for Stream flow

3
72
72
144
216
288
576
1728

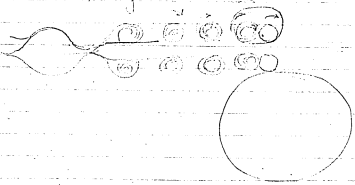


Possibly the only a surface effect the waves not being able to enter the wood & thus distort the waves. The waves come below Copper etc but are very little hence the deflection is greatly ~~which now the waves enter elsewhere~~ [illegible]


This would be as if the prolonged the
Electric wave
O
[29]



If there is a light mass blown into a vortex ring –

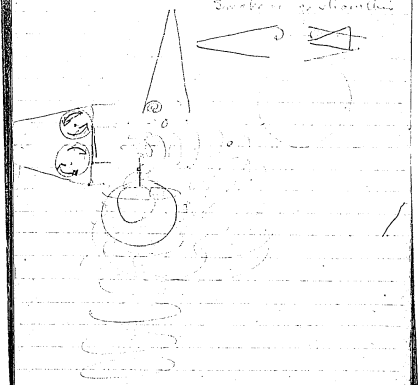


When vortices strike mass they meet resistance & contract to form larger rings – & the number of vortices per second demanded if they were originally 400 in m. they may contract to 1 in if induction circuit high enough,

or closed ring in direction mag. will start by a vortex ring stopped or still –

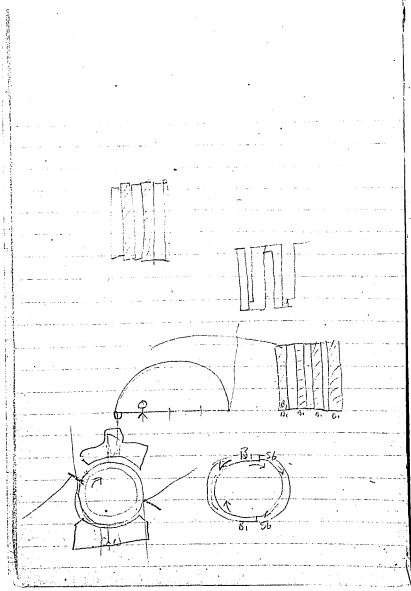
Principle of a megaphone or speaking trumpet due to Lodge, sound waves

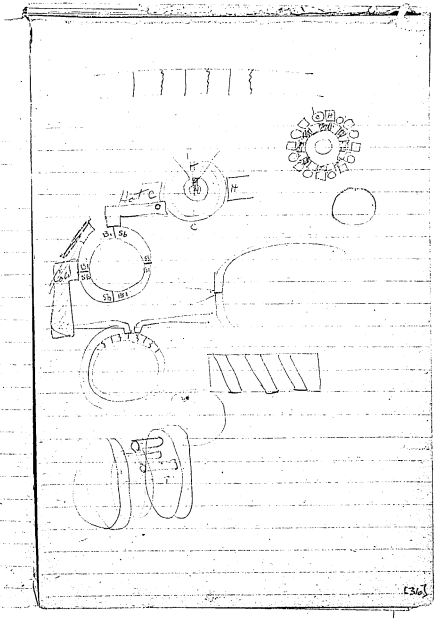
Section of a horn

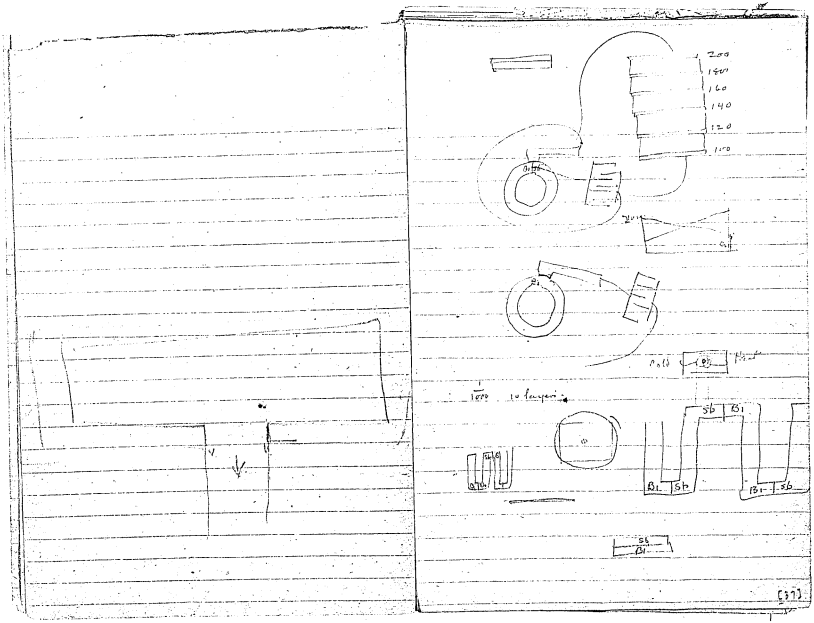


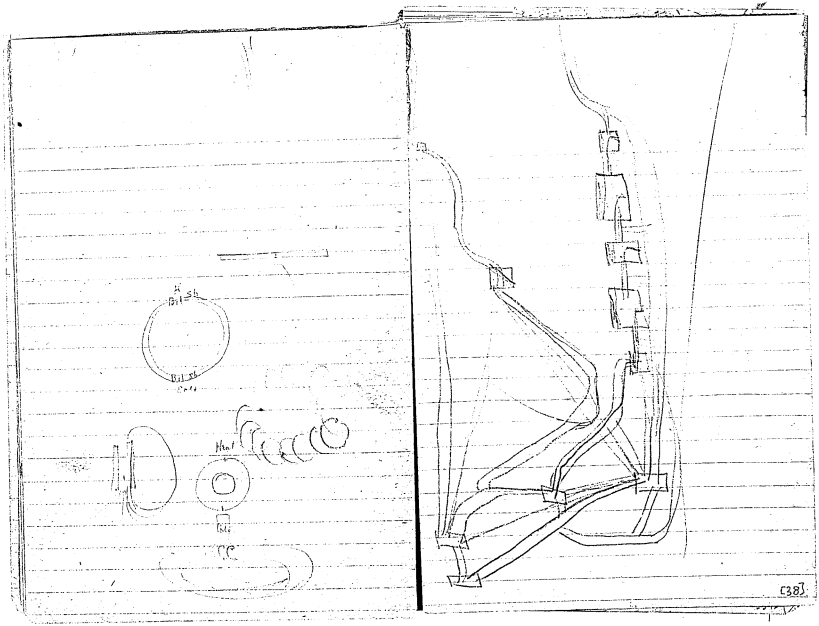
[32]

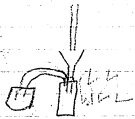
[35]

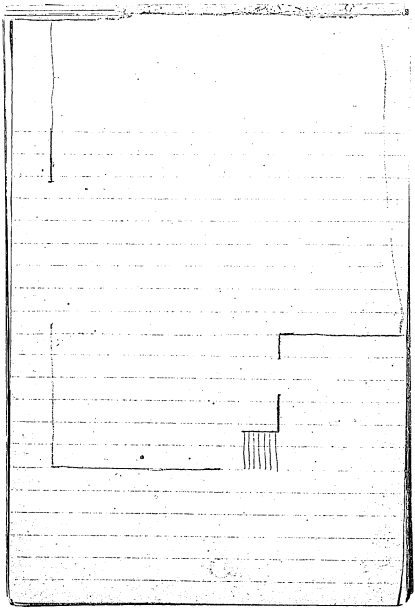




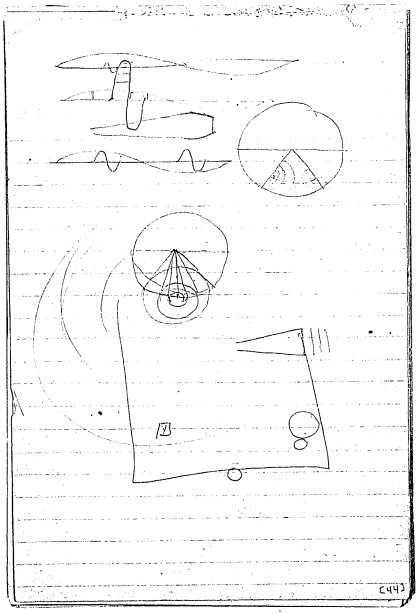

200
180
160
140
120
100
10 layers
Sb
Bi







[wa]



12.5
7.50 marlin
14.5 miles.

L. L. 60 feet, .003 thick
6
30
15
75
2 3.75
2 1.875
937

.006
.012
.024
.048 — 3/64-thick
.096
.192 — 180 thick

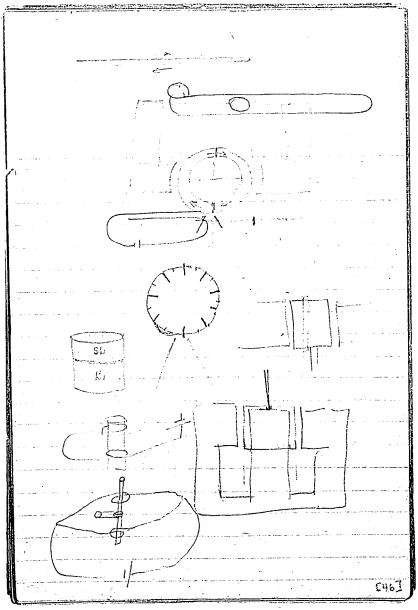
strip across dia 1/16 units .003.

62) 372 (60

3.75 leeway .060 thick

3 — 3/80 —
30/676 leeway

80-
60 leeway
3 leeway
60 leeway

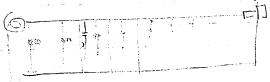


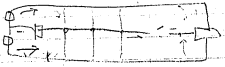
[46]

146 oz/yd²

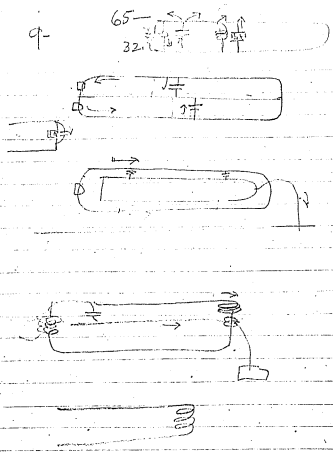
190 oz/yd²

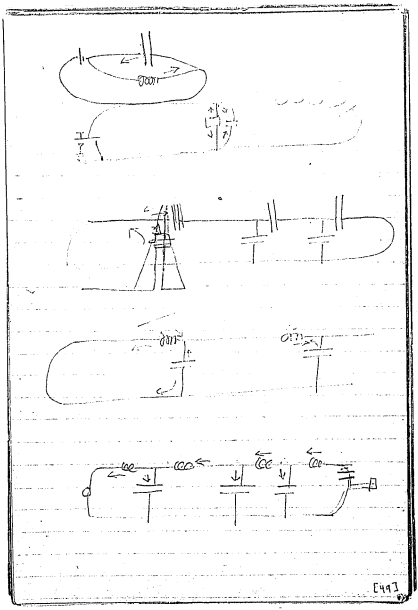
1 MIM Gee 1 Proof Comp

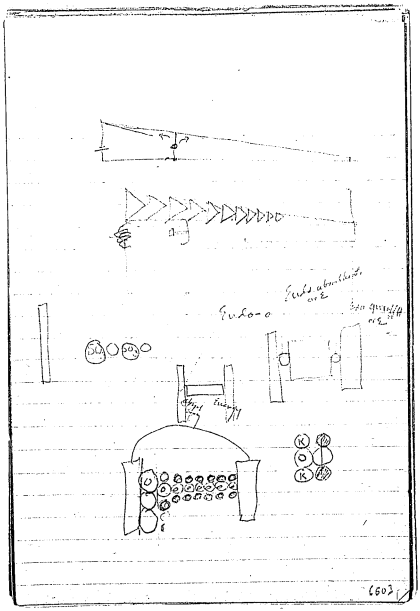


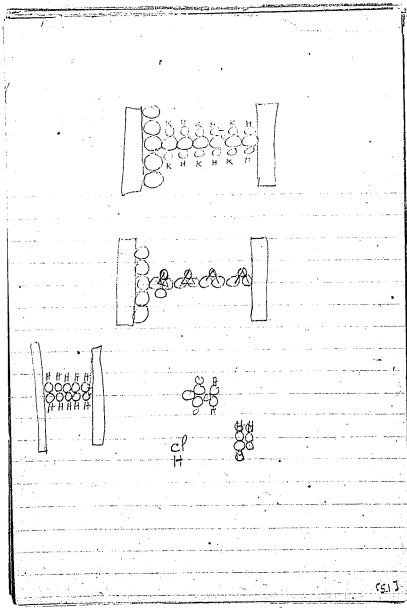


9-



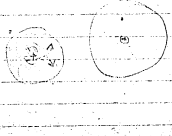



Fuhrer-o
Fuhrer-o
Fuhrer-o
K
O
K


Cl
H

clip

melting iron copper and all metals have.
Current thrown on them with Copper it
causes instantly great white heat & produces most
wonderful changes, (with iron)
known, shine (as a secondary action
~~[illegible]~~ its conducting
power for the electric current is many times better
than any Platinum wire that it had
[illegible] [illegible] or gets worse
than Copper
Evidently there is a close [illegible] gether
than all other metals or effect of
E. into throw them further apart,
They probably explain why iron
[illegible] [illegible] for other
[illegible] [illegible] of the
metals.



Action magnétique

Théorème moyen électrique

Théorème Ampère

Théorème de Gauss

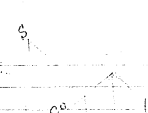
Théorème de Stokes

Théorème de Green

Théorème de Poynting

Théorème de Thévenin

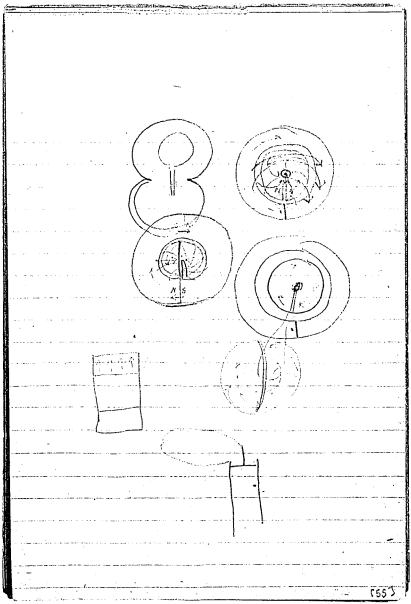
Théorème de Norton

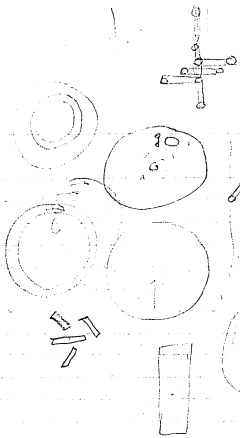


Iron and Copper have similar molecular
orbits - under influence of E shown
the orbit of Fe is nearly oblong while
Copper is almost of circular form. Still
the mean orbit is oblong at right angles to
the E waves or parallel to the wires.
Point, when E ceases the Coindence
of the Iron Molecule to come
back to Circular orbit of a given
but energy it retains. Condition
supplies it from fly to keep it in
oblong path, more oblong it is the
greater the power required.
While under E shown iron is heated
the orbit becomes circular again
at the critical point on cooling that point

Iron and Molecular Magnet

0547


N
S
E
W



The molecular air current, ~~[illegible]~~ to act
them at right angles to the Mega current.
When work is ~~[illegible]~~ Physically, no
work could be done therefore, the

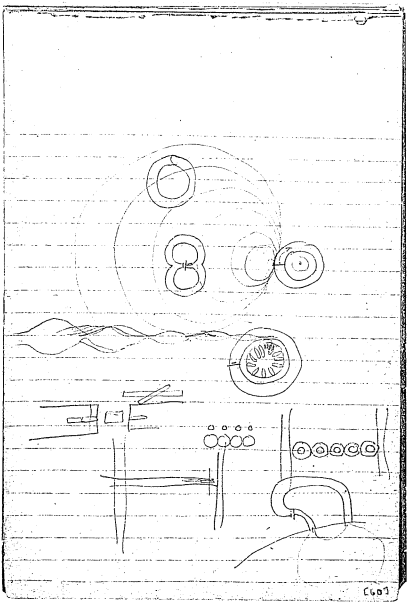
Movement
Movement of the ring must be done,
against Elastic resistance, this
Couldn't be mechanical, this would
not give a weak current, it must be
against the elasticity of the Medium.
Ether or combination of the ingre-
dients of the Ether giving varying
resistance to the Medium —
& therefore take the form of a disturbance
of the Medium of the Ether moves in
one direction than the other
or if orbital disturbance of the
orbit from circular to Elliptic,
or vice versa Yes against
Elastic elsewhere

The difference between attraction
of two Copper Coils & the same
with iron is that with Copper
we only have Yes or no current & diff. Material
& Cage of iron we have Flux
& Molecular

Iron core as always acts like
Copper but not as strong on
account of the Elec Effect
but we have a third Current
Consisting of a molecule which
has Enormously low resistance
& has that Mass & Elasticity
but Molecular Elasticity is
weak, part atomic part Ether &
now below the reachmount point
so magnetic a change in the
Molecular arrangements & forces
place at that point when the
field is strong by the ~~[illegible]~~
other Metals

[853]

27	492	82
25	521	87
23	525	87.5
21	530	88.3
19	534	89.0
17 +	541	−90.1
15	501	90
13	536	89.3


[603]

Electrolysis is probably only
a change in Ether pressure
a atom of Zinc torn off
a Combining with Hydrogen
Lets down the pressure just
the amount of Energy of pressure
it required to bring the Zinc
to metal -
Compound bodies alone
further apart than, Simple
Elements like Zinc
Therefore when Zinc goes from
a compound atom to a
Compound there must be
a release of pressure ~~with~~
Located on the universal
Ether pressure & this
pressure Equalizes itself
in the Ether & goes over a
Simple metal, It would be

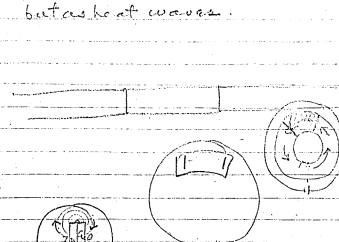
[61]

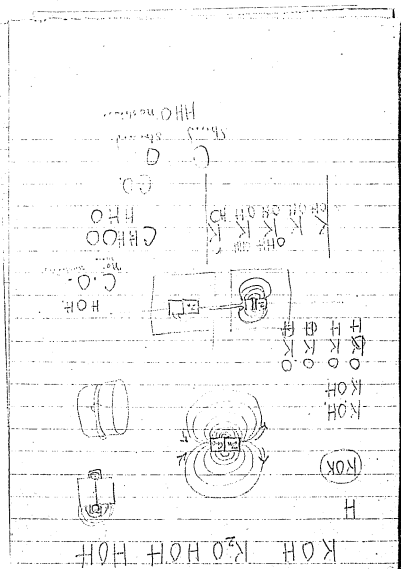
The Energy so Chemical + the Either lost no heat or light according to the residual influence Exposed to the action made of the Either — Light & heat have are Having a molecule to the ether, + Con

An Electric Current Conducted Existing Discharge on a molecule Conductor on the Ether has perfect Conductivity the molecule of the Energy expended ~~[illegible]~~ Be also applied Then the Ether + light would be given off - at the matter giving Energy + no Effect as we Know it =

In a battery E is also combustion action, its temp being depending on the resistance of the circuit to Discharge the electricity Enhanced -

This shows all the come can't get into the Ether outside of the vacuum on account of Matter which is Elastic but it can go on the Ether in the corner of metals are not elastic, but it goes into the Ether not as the waves but as he at waves.





To here our education the necessary to have a mobile Liquid the atoms of which are Zero stressed and Two other atoms, which are to be combined to furnish Energy which are stressed & high gradient —

Two stressed atoms Elements can Cause of combine without the intervention of neutral stressed atoms.

Dry Combustibles do not Combine Except in the presence of Water or with aid of Electric pressure! —

Thus case with dry Carbon & Dry Oxygen — Now if we put O + Zero in water there is no Combination when the Current

How does this bring about Conduction

The water in the ~~act~~ of combining changes the Condition so the power conduction

What change does it make

HCl gas has a great affinity for water.

But KCl hasn't much affinity for water

Calculation shows probably this is about as good as HCl

Because of the great affinity of water for HCl and KCl

Reassume the grouping of the atoms in the molecule

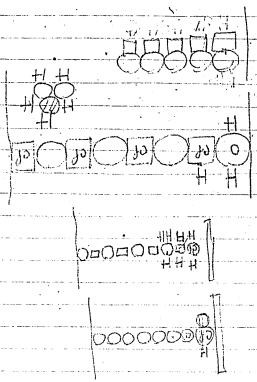
as changed + a molecule has the H+K enclosed + the radicals

Lately examined & found the Hydrogen on the Compound & made the Acids & Acids

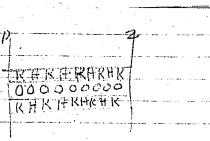
Electrolysis of the 2 Separate ions

Lately discovered a process for Hydrogen

[993]



Hof Kcc.



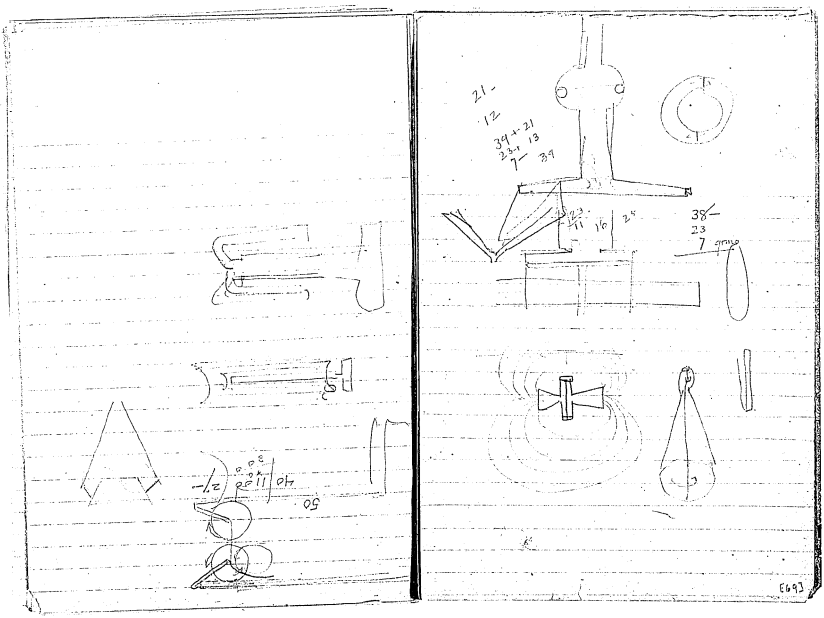
and when the circuit is closed they set themselves at right angles to the Current like a Magnetic Male and Female ~~[illegible]~~ Electrons, where was vortex created so to speak the O ~~[illegible]~~ ~~[illegible]~~ ~~[illegible]~~ P of the N to N ~~[illegible]~~ ~~[illegible]~~ takes place ~~[illegible]~~ tube,

It compressible for the ~~[illegible]~~ volume has work they other, to dissolve in water & be decomposed to oxygen

potential state

.24

5


21
12
39+21
24 13
7 39
38
23
7
16
24
50
40
11
27
E693

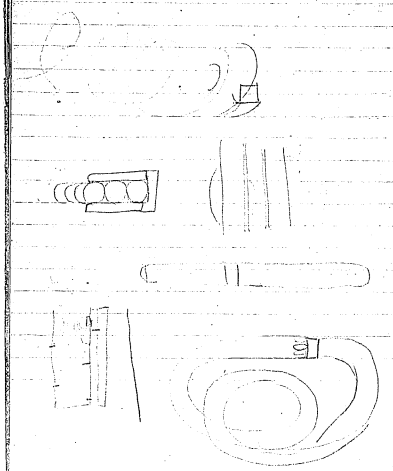
11 grms NaOH
3 Lithia –

16
78 grms

8 | 250 | 30°
24

Nickel makes no contact with
Electrolite in Mf & S Storage
battery, the only the same the
Oxygen What does this
Dignify –
in fine weather, the Energy of the
new compound decomposes against
Energy of H_2O, — if something
put in Water which dissolves
(Energy given out when formed
than $O_2 + H_2$ it should explode
but, K_2O has power of combining
with Water, thereby the resultant heat is
due to the [illegible] of [illegible]

(703)



between the H_2O & the other.
in other words a very loose
combination of H_2O with X
in which the lowest valence will
decompose, in the presence of H_2O.
or, the metal & O will end at Epsilon.

H_2O is the radicle of KCl.
Solubility, is common these substances
which give off in act from your
Combining time cost hydrates,

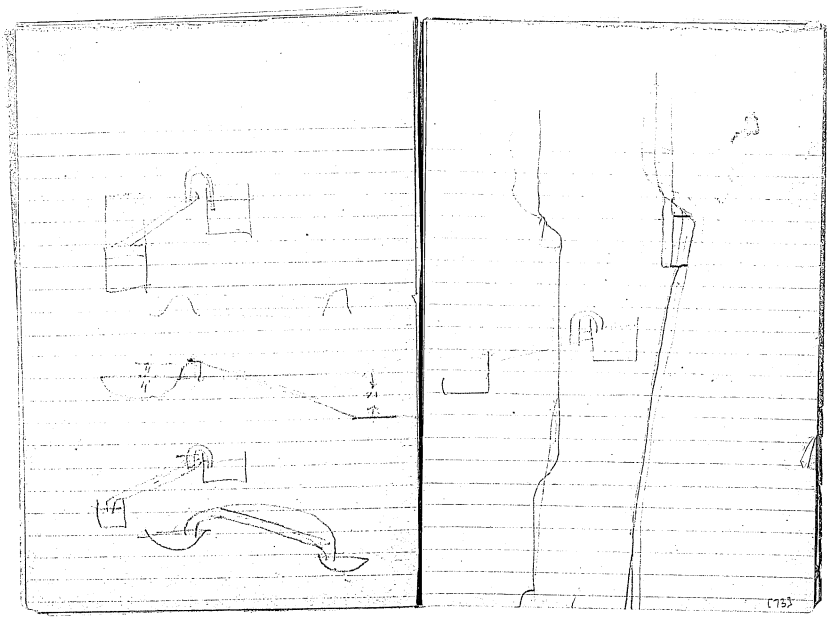
$KCl \cdot HAO$ KI $HO\,HO$

$KH_2 \cdot H$

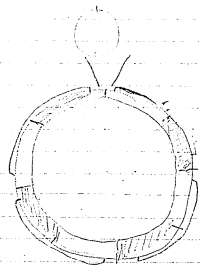
both

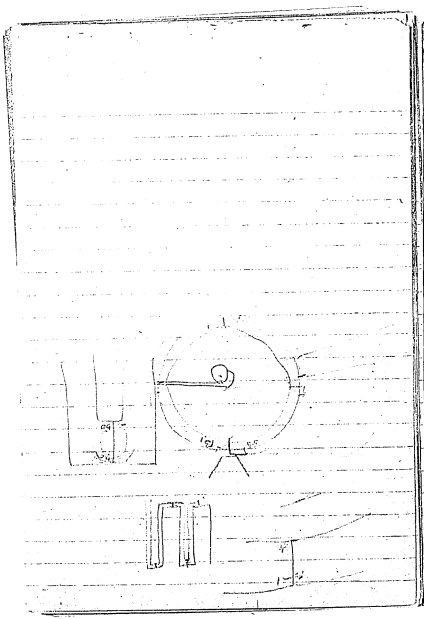
K_2SO_4 H_2O

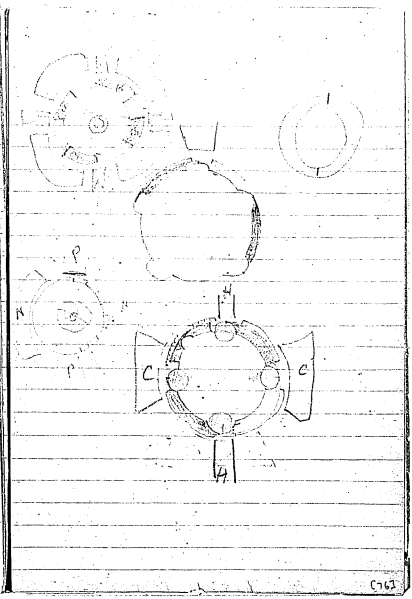
25
31250
125
2000
17500
93750
2000
2000
212 to 90
122 to 122
212 to 122

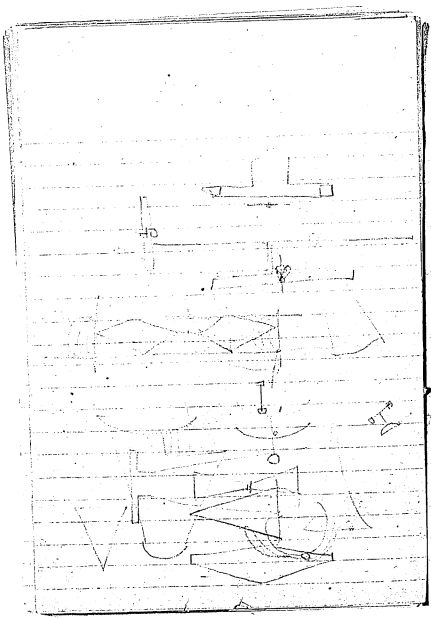


20
30
60
30
60
20






P
P
C
C



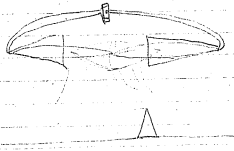
Short Cir. [illegible] Short-9 [illegible] 1 [illegible] left by
9 ohms. Bob 299 [illegible] Commutated,
[illegible] ohm. 1203 ohms.
[illegible] .77 ohm. $\frac{1}{1000}$ inch wide $\frac{1}{1000}$ [illegible]
10" wide .0001 ohm.

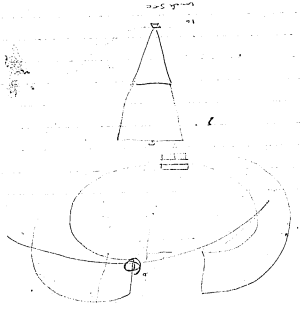
.0001 ohm - $\frac{1}{10}$ of volt.

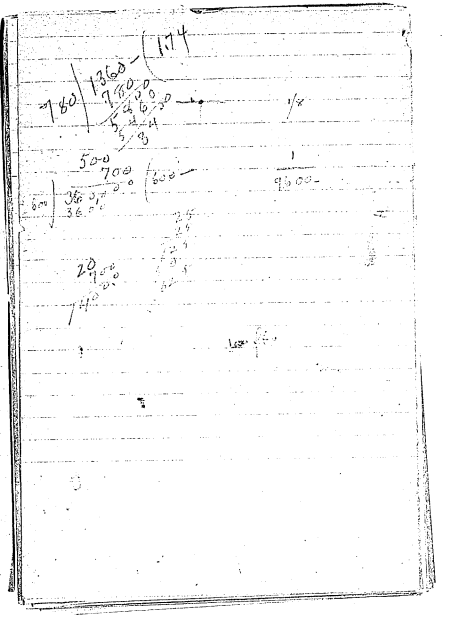
1 Volt / 400 = 2500 amp
2500 × 10 = 25000

25 watts,

[18]

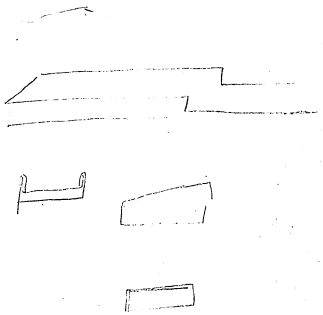


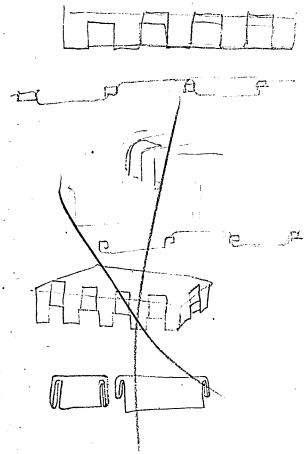




Notebook, N-03-01-22

This notebook covers the period January-February 1903. All entries are by Edison. The book, which has been used in both directions, contains notes and drawings regarding electricity, physical theory, and the nature of matter and energy. At one end are entries pertaining to various experimental projects, including "xyz rays" and etheric force, x-rays, storage batteries, and fluorescence. At the other end is a list of chemical compounds to test in "xyz ray" experiments. A notation at the end of the list indicates that this material was recopied into a "big book" (Miscellaneous Notebook, E-4296). The pages are unnumbered, and at least one page has been removed from the book. Approximately 100 pages have been used.





70-

24 | 216 (9
216

15 300

600 - 1,800

1600, - 1600 mg

2.16 - gm

6 | 120
20

1 | 6

10-

3 | 120
40

36-
90
324
90-

3.6

75
36
45-0
225-0
270
2 | 270
1350

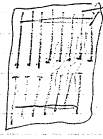
45-0 | 1350
1350

3 Lbs.

180-

160-

120
50
70



Jany 22 1903 –

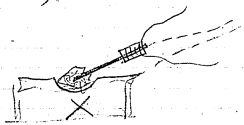
Try and photograph the outflying sparks from different metals by losing a current with big Condenser surface, Each metal gives a specific kind of spark – also try Sparks from abrading with Emery Cobalt, Try powders Reduced by Hydrogen Throw in Carbon & generally investigate this subject. Try alloys & see if the 2 or 3 metals can be detected by the spark –

Investigate the smell of Tin,

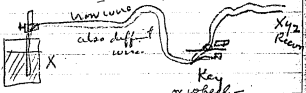
Test the variation of friction when metals are used as one pole remember old Experiment with Tin

January 22 1903

Run down the argillaceous smell of alumina, clay etc, all clays smell, also precipitate alumina, suspect alumina lose smell by heating red hot, What is this smell,



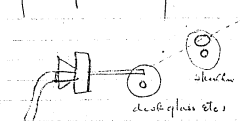
X Blacksmith forge — anthracite or Coke, iron rod one of any thermo C dittto when rod magnetized —



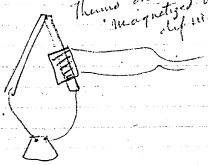
X Cup with acids or other liquids ultatily the metal.

January 22 1903

Theory being chemical reactions
sensitized and as waves through
wire — can use wire wire —
Connect diff metals in cell —
perhaps a ray comes and

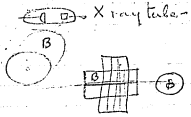


see if light affects formation of
photo. paint on glass etc,



Jany 22 1903

Try small cylinder pears soap in Mol. graph —

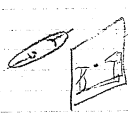


B core cylinder of metals with 10/1000 hole in center or less as 3" long — Lead Iron brass Cu etc so X ray beam goes through Coil on outside see if effects it, also heating etc

Possibly some of the many fluorescers I have found does not fluoresce to X ray but to other rays, possibly a screen that would cut off X ray might not cut off a ray that would

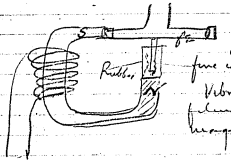
May 22 1903

fluorescence to come, Try Experiment by Eye & photo on slides, with different absorbing screens to see if the screen acts alike on all — Make a special slide with all the fluorescers — then absorb by plate glass, then air then aluminum, etc if all act alike then its all X if not then there are other rays or special fluorescers —

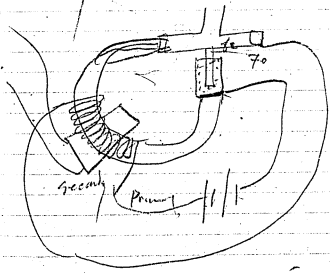


lead fine 002 hole — look fluorescence — try magnet pole — also light ray also jump sparks on ray just as it leaves lead to see if it can be affected — flame — etc, light, etc.

Jan 22 1903

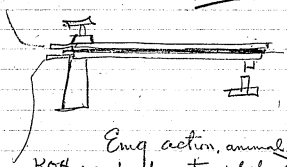


fine iron filings —
Vibrations dislodge filings & vary the magnetism,



Double action varies Mag & Current,

Jany 22 1903



Emg action, animal membrane
KOH, neat, fly-two phalanges opp'g
possibly glued to, such of light
Changes stiffness + one side
relaxes other stiffens hence
Spring Curve,

possibly a long piece of
Carb | Strip | with KOH +
foil pasted on sides would
Cause bending —

Perhaps in phalography fluorescent
slides, different results to be
obtained by having them in
Magnetic field —

Jany 22. 1903

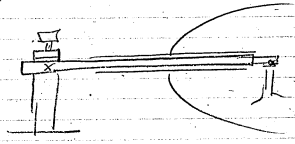
X Ray tube from pole, try effect in magnetic field.

Connect wire to top of flag pole on Laboratory, & connect end to X ray tube at top, & bring down into phosphorescent room.

Dont forget to make reports of Cogitations over the ore body for sudden changes in Earth's Magnetism also for sounds due to rapid vibrations of ore body brought about by Coosmical Nonsolar changes & Spot movements.

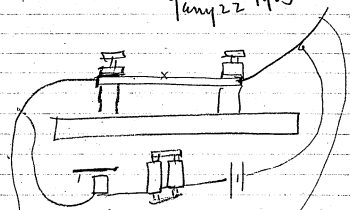
June 22 1903

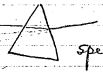
possibly there are very rapid
Barometric waves continually
occurring. These could be detected
by an Aneroid diaphm —
or Telefoni, or Carb button — Emg
or direct listening or a Mirror
slot + scale



X is piece of ground Carb
Otherwise two disks on each
side not touching. static
Wave changes legend to
one side, bend, Emg action

January 22 1903

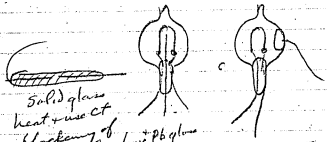


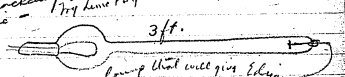


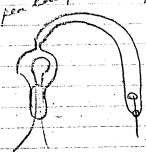
Dec of X ray passing prism,
disturbs Spectroscopic image

June 26 1903

Complete the experiments with the Center wire in lamp bulb also with pt foil outside the bulb, get granulature measurements.







over

May 26 1903

See if X ray will change the Conductivity with Central wire,

Try Alternating Current
possibly it will give continuous Current, & act as a transformer

Try Center wire bulb in oil to see if temperature affects quantity Current,

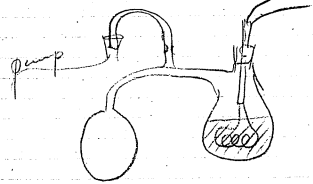
Use phaloumber & with Weston measure Current & Voltage & Power as lamp is heat up until bursts,

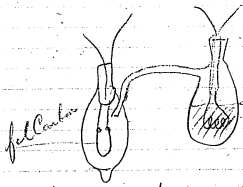
---

Try and reproduce the Peacock Colored films within the Lamp bulb when gasoline is inside bulb & heated to get Vapor —

January 26 1903

By distilling in a Vacuum ~~and~~ by ~~pt Cracks~~ platinum wire & paraffine etc see what it does –





distill in Vacuo & Crack by heat of filament & get new compounds

Jany 26 1903

Try the best fluorescers for light in Becquerel phosphoroscope & get one that has most brilliant phosphorescence for 1/20th of second dying out within that time so a screen for the Kinetoscope can be covered with it to and in giving a more perfect picture

Test all the fluorescers phosphorescers for X ray & light for light taken shaken in vacuo tube in dark also when ground in glass mortar & powder in the dark, recording relative light

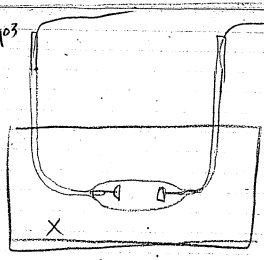
Jany 26 1903

I believe that it is only the hydrated peroxide of lead that is active in Storage batteries, hence to make a Lead Leland Mix hydrated peroxide Lead with our graphite moved in block the lead perfect pocket + use Sul acid + amalgamated Zinc —

Try of Leland's CuO plates soaked in H_2O in Nitly to get 5% H_2O into pores of CuO plate keeps walls wet abs. Zn in twice the present solution —

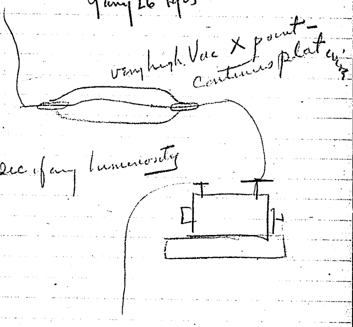
Possibly CuO can be molded under pressure + used to better advantage, as to Vallays etc,

July 26 1903



X ray tube with glass
quartz - immersed in
H_2O also Liquids which
absorb X ray in X Tank
Notice phenomena —
also Coal Liquids —
also hot

Jany 26 1903



If Ions are free then FeCl or $FeSO_4$ Electrolyte showed deposit to one side in a magnetic field —

Monochromatic Light Sodium Bromide is best salt in open flame Hg for Tubes

Jany 26 1903

Radium may be radiant matter at ordinary temperature while other matter would radiate at higher temperature. Try phosphorg thro opaque sheet from incandescent metals kept hot by flame or current, also — H flame, also monochromatic light from salts. of metals. Sal Bromides by wick in flame gives 24 hours time —

Make a transparent cell that can be put in a camera like a dry plate. Use say Cu electrotype & polished Silver plate & a wire of Copper & focus a picture on plated from arc light or sun & then deposit Cu with extremely weak current so just show — see if light affects deposit so a

January 26. 1903

to give a picture

Try Chloride Na solution & gold with iron to take C and H, trace of Chlorine flush of colors is blackened, if not develope trace

Try acetate Lead Mn Ni + Co Salts to make black oxide deposits very faint —

Use spectroscope + monochromatic light pass X ray through the light

Try diffrent vapors of metals Especially heavy metals in form in air — Hg tube, other metals in Vac tubes also in addition to X ray put both in powerful magnetic field

January 26. 1903

In Capillary tube + bulb 1/4 dia

fill with good absorber of X ray & test if absorption moves Capillary Column

Celluloid Cell with dif Electrodes & Solution with galv for Voltage. put in Mag field also use cell as a diaelectric, also act on it by X ray on both or one Electrode also in out Mag field, also heated, Cooled + while strained

9 mo 26 1903

Make a small Coil with inside big enough to take the Thermo alloy button. was made by Elec furnace & by Rick method test the Magnetism,

See if X ray affects the Catalytic action of platinum black

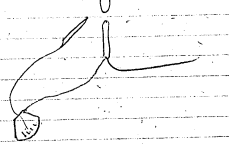
find a semi permable ~~ar~~ substance for def rays from Vac tube, to seperate the def rays + photo them —

Jany 26 1903

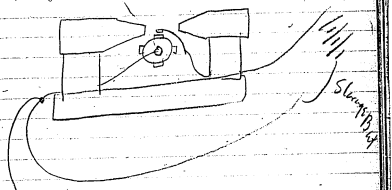
sound mechanical vibrations into a long buried steel wire, use microphone pointed on end of wire to make a sound. have this sound control a second Mechanical vibrator to send into a 2nd wire with proper resp. which might talk from NY to Phila.

The internal kinetic of the molecules by surrounding fluid with coil & use breath which with air blown Spark would photo heat molecular disturbance or heating coil [illegible] in water.

See if the Carbon wire used in Incandescent will if connected to arc light give a current



One break better — Big Mag May 26/15



Big Mag break it
up in the field
get a snap like a Cannon
or by Ether etc —

Ether powder

It seems to me that a peculiar thermo could be made by using a metal having a very low specific heat like lead joined to one of great specific heat and only get current by momentary heating the low specific heated wire. I get quite hot before the other showed much of anything this shows

Jany 26 1903

do something although the joint when both same temp. might not give anything, possibly might give XYZ — ?

by proper Commutating of the heat extremely powerful thermos might be arranged —

spec heat wood charcoal	0.24
Crystyd Boron	0.25
Magnesium	0.25
Lithium	0.92
Lead	0.03
Bismuth	0.03

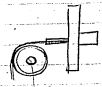
Perhaps the momentary throw of the galv when one drops a metal in a electrolytic cell is due to above action,

Magnesium & Bi or Lead

Shaned work.

January 26 1903

Why is it that when a sparking tube is working that the rubbing of the hand or finger over it make it look like Wheatstone's that would show that a static Molecule is possible — Thus



Glass cylinder Very thin walls filled Hg + connected to Earth the gold foil rubbing on glass + connected to Dynamo —

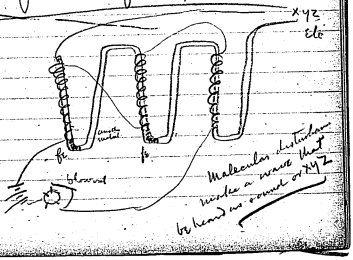
Melt some magnesium, ditto aluminum in Very high Vacuo, + pour to oxide in Inlet, Cool. Use current to melt & think both Mg + Al are alloys with Oxides + in this way can get them pure — possibly they could be distilled in Vacuo high —

January 26 1903

It is very strange that a ring gives no coloration to Vacuum tubes by opening. Why? –

What effect X ray have on a soap bubble,

Make some of those phosphate glasses & see if they can be blown also other chemicals of glassy viscous nature capable of being blown so as to get X ray tubes & cool filament of carbon in –



January 26 1903

If Ions migrate at dif velocity

then a vane or plate suspended in Electrolytic Cell w/ Brownian movement

Can be detected by Murray's

Beam of light showing moves

by the unequal movement of the ions

(A platinum negative should

be capable of printing by

X ray as pt absorbs ray)

In addition to the Electric waves

of an oscillator or Coil used

by Marconi there must be a

Sound wave sent into a space

perhaps a flame would detect it

a million vib a seconds would require

a resonator 1/64 long possibly

a porous plate 10/1000 thick

By 1/4 dia connected at base of

sensitive flame the pores would act

as resonators + affect the flame

9 Jany 26 1903

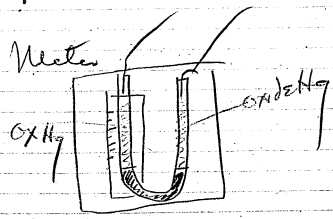
If this is so the possibly the Mclough might work instead of Brankley the friction being given on dry porous substance by rarefaction & condensation of air in pores.

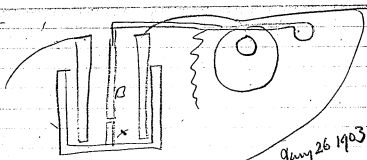
If X rays are due to particles shot out then a disk of platinum 1/2 dia suspended by single fibre silk & provided with Mirror, scale & lamp & screened from X ray on one half should give deflection when ray strikes —

To my mind what we call the X ray that photos & gives fluorescence is a sound wave ~~& the~~ or gust of particles

9 Jany 26 1903

X Ray bulb within another bulb with Electrodes, one of steel to get very high Vac & see if X ray pass thro the high Vac from the 1st bulb —

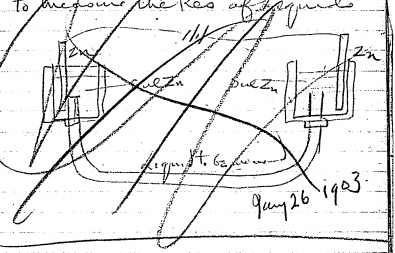




Jany 26 1903

Sparkless make & break Rubber
Cell Sulph Zinc Zinc Electrodes
X partition upper half moved
up & down. Liquid Conduction
practically stopped when
B touch. X - etc
Could use magnet & shu
shutter to make it automatic

To measure the Res of Liquids



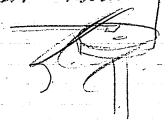
Storage Battery submerged with PbO

ROH Electrolyte, grid filled with PbO_2 Hydrate, Copper finely divided in other grid, (when discharged)

$Cu_2O + PbO_2 - Chg\ PbO_2 H_2O +$ Cu metal –

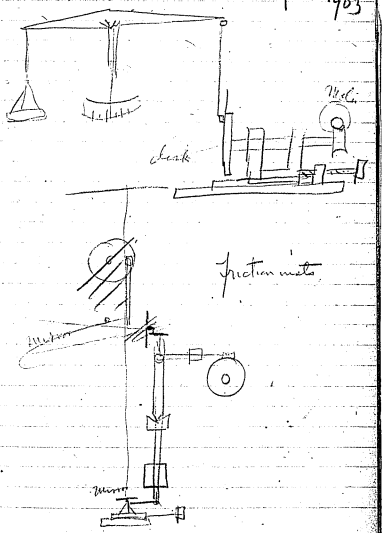
Instead of Cu possibly another metal not decomposing pb salts could be used,

It is possible that friction between different kinds of hydrolized matter is very susceptible to alteration by all forms of Energy — stress, & that mechanics based on alteration of friction would lead to the discovery of many phenomenon which phone with Al trihydrate sensitive is 2½ times more sensitive than Bell phone

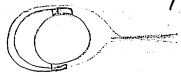


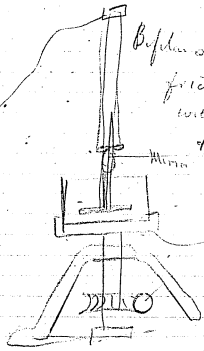
OVER

May 26 1903

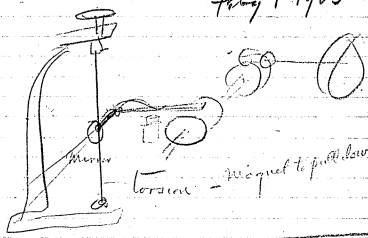


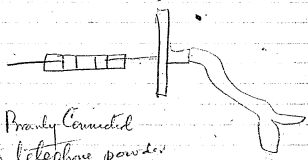
Feby 1 1903




Bifilar suspension
friction liquid,
with diff liquids
+ poles
Mirror
Motor
X42 E etc

February 1 1903





Prawley Connected
to telephone powder
makes sound

Feby 1 1903

friction wheels

Pivot

photographed where it touched

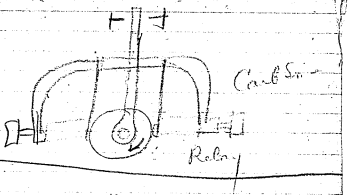
Carbon

Rubber

Relay

wheels keep rotation on circuit

Motor



Qual Expmtal purposes

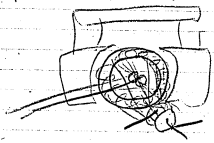
Chloride of Silver fused in air atmosphere of Chlorine is perfectly transparent
ditto Br Silver in atmos Br
ChlK BrK KF from clear crystals produces on fusion perfectly clear molasses

Arsenic Sulfide with sulphur 3 of S to 1 AsS solidifying to soft amorphous mass are becoming hard & brittle after cooling

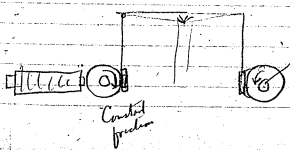
Phos'

Feby 1 1903

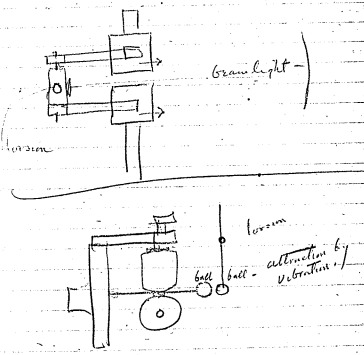
What is the effect on a ring armature if wound with a Coil + two Current rings + the now saturated + soft iron this the Ring Dynamo working is part with Commutator



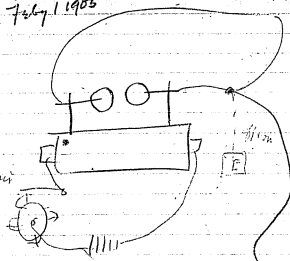
It might do away with the sparking friction Ring Joints



Feby 1 1903


Gram light -
Iron stem
loom
ball
ball - attraction by vibration.

July 1 1903



Bombardment and waves
made by Condensation
carried through wire
Used Cu Fe + XYZ
metals at end cut off all
Elec by burying 100 ft
or more

Thus old gas many million atomic
knocks per second exhausted
note some XYZ met at
great distances, in bare wire
Buried in Earth
Possibly X ray tube gas better knock

Feby 1 1903

I am almost sure a primary ~~with~~ galvanic electric will do wonders as good as coal all that is necessary is an extraordinary strong break.

---

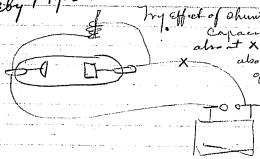
possible a storage battery could be made with both electrodes ~~of~~ only spongy Copper in KOH, on oxdg to Cu_2O the other plain Copper ~~with~~ forming bottom of cell - in which Selenium powder covers on charging Spongy Cu ~~[illegible]~~ oxdg to Cu_2O while Se combines with H to form sesquiseleniated H dissolved in acid on discharge O oxdgs the H & Se falls to bottom & so on — fallacy probably in this ⊥

Feby 1 1903

Put a little test cell in Fe storage in strong Mag field see if action if Mag on Fe effects Cu-Pb on Zn while being charged & discharged perpendicular + Right angles

Hydrate of Pb (Copper)
Copper plate, Electrolyte
Sulphate Cu Pb
Charged Metallic Cu per ox Pb
& Saturated sol Sul Cu
Discharged - Ox Cup -
PbO_2 reduced to ox + formation
Sulp Pb -
No reduction of Pb on Cu
as its below Pb in Scale
Nothing falls off Cu + Cup
~~[illegible]~~ not affected

Feby 1 1903



The Universe is composed of matter + the medium —

Matter disturbs the Etheric pressure —

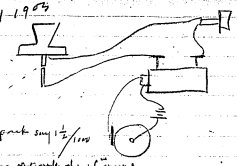
All transformations of energy is the transfer from high to low pressure in the medium —

Transfer is brought about + is transmissible by the difference between the tension of the matter + the medium —

In a battery the oxidizing acts as an abutment to throw out the strain wave acts by its inertia relative to the medium — The wire of the circuit is the plane around which the waves pass the inertia of the wire permitting

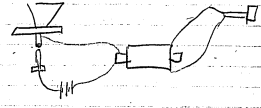
Right angle rarefactions + condensations in the medium, without loss of energy except in the wire which not having perfect inertia or tending at absolute zero the metal of the wire would have probably almost perfect inertia relative to the medium. The strices travels along defer light towards to the wire & the waves are very long at right angles to the wire.

July 1-1953

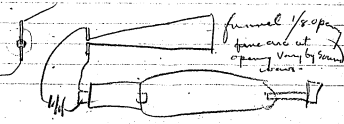


Gimmicopark any 1½/100

Varying spark distances increases - decreases Volumn Sound by talking wheel to make, higher note than piccolo any 12000 - sec -



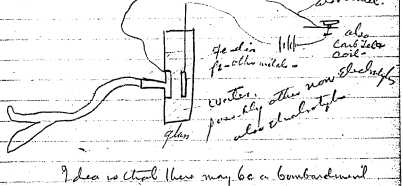
Carbon points, very fine one - very one by vibrating disc -



Feby 1 1903

Try using Eng with Carb Shunted as a battery when Turning its Reversable, see how voltage is also what ampere can be got from it, possibly a low resistance could be obtained —
also try with different metals both holding Cylinder + point, might be lot of phenomena come out of it —

Form precipitates within the pores + semipermeable materials

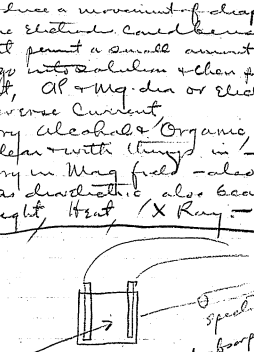


Idea is that there may be a bombardment of Molecules producing a pressure

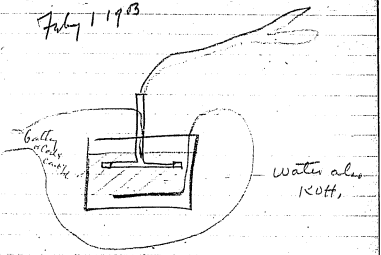
C.

Feby 1 1903

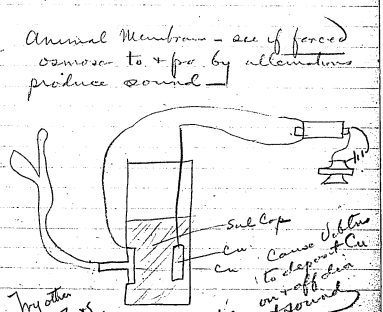
possible an electrolytic Compound
fused be thrown into a bit of solution
for small wires & the osmotic pressure
produce a movement of diaphr —
Some electrodes could be used
that permit a small amount oxide
to go into solution & then plate
out, Al & Mg. dim or electrode —
Reverse Current
Try alcohol & Organic
clean & with things in —
Try in Mag field — also
as dielectric also bacon
light, Heat, / X Ray —



February 1 1903



Animal Membrane – acc of forced osmosis to + pro by albumen produce sound

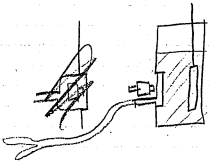


Feby 1 1903

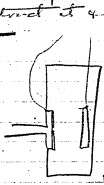
the throw of the Molecule of Cu should more dia, —

Co deposits under strong mag'tic might be good —

Also put a magnet ~~so that~~ set dia + base Fe to deposit,

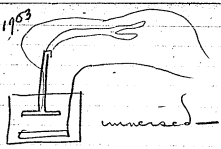


then when Fe deposited on say Cu the mag attract it & produce normal —

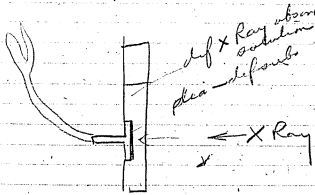


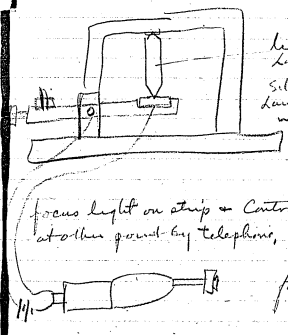
possibly dia of wire with 1/8 inch Cu in Centre do deposit Concentrated rays blow at most sensitive points

July 1 1903



This form would be very handy to try quickly a lot of Experiments on this principal — Make tab wheel also Carbon Tel & Coil — perhaps dielectric oils would be good — Sensitive flame made and Eu tube might detect flames of extraordinary pitch —





focus light on strip = Central beam
at other ground by Telephone,

Feb 1 1903

On solver deales for Carbon Telefone
probably a number of metals advised
by H from their oxides would work
Pt black, Ag Cu Ni Co, Bi, Au Pd
Ir Ru = also NiS, + Si amorph =
our graf = also amorph graf purified
as we do it =

Experiment with sensitive flames as it may be possible to get them in connection with a telephone far more sensitive than the ear — possibly the movement of the flames could be used with device on last page to repeat & thus get infinite sensitiveness, strangely — possibly sensitive flames would be modified by strong field of mag as it has great influence on flame —

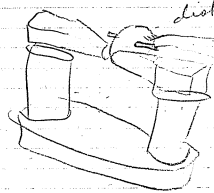
Possibly combustion in flames are a series of molecular explosions and if so these explosions might be propagated to a distance to affect another flame both sensitive a shutter a telephone showing it up —

2/1 1903.

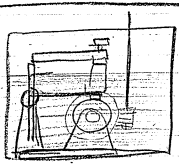
Feby 1 1903

As a flame is so easily affected by a magnet perhaps it would give an alternating current if placed between prongs of a permanent mag surrounded by a Coil + a telephone used with revolving wheel etc to break it up into waves or a Brunlay would detect the Current or a Bifilar Electrodynamometer with no wire — This would be a great scheme, the malacular explosions disturbing the lines of force — possibly a Trompe could be used with the gas to throw flame in a belt of the field this gives sounds or waves

Feby 1 1903



11/1903



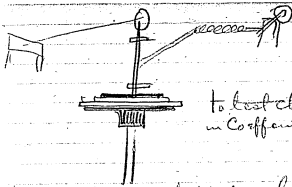
A coil of a Galvanometer to test Thermo Current produced by Rubbing the cylinder being of one metal & the point the alloy immersed in distilled water — test current with Weston galvanometer

See if the scintillations of Mg
Fe etc occur under distilled
water, also gasolene —
also in Vacuum ? ? if preserve
their character — also see how
scintillations are changed
in strong magnetic field —
or within helix with powerful
current passing —
also in powerful static field.

Try X ray 24 hours on a
flower in pot — having leaves
= guard 1/2 of leaf also 1/2
of flower by Lead sheet.

Coefficient of friction should
be changed by X ray —

Feby 1 1903 MC

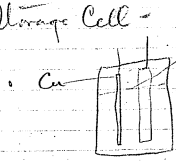


Feby 1 1903

to test change in Coefficient friction

by Current X ray light etc flows
dukes, ground dead flat.

Storage Cell -



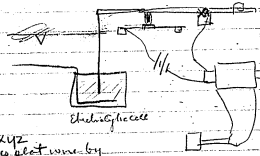
Manganous Sulfate also sulphates
of Metals which are decomposed by H_2O
to which form quadric salts

Charged Cu - Cerric Sulfate
deposits Cu_2O Cerrous sulfate

Feby 1 1903

possibly instead Cu metals
finely ground scale could be used
So long as they will not reduce
Carrier to Cerous of themselves
possibly Pb, Tin Sb, Co perhaps Fe
but doubtful — all finely divided
with Hg alone or Hg + Cu to insure
Conductivity — thin grid —
Possibly Cobaltous Cl Cobaltic Sul. Cobalt acid

Better try Cerium hydroxide once more
getting paste stiff + mix 6 + 4 instead
of 8 + 12 400 passes + see if
possible to gilt it cat as well as
$Ni(OH)_2$



Current or XYZ
Either moves plat wire by
Surface tension or gas
to work microphone

Feby 1 1903

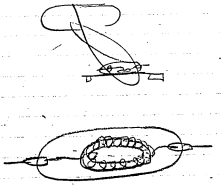
Deposit Fe on glass in high Vacuo, do it on the pump use double electrode, each a loop so a current can be passed through loops to heat it & drive off gas etc, then by spark deposit on glass one side protected, want to see real color free from oxides —

Try all the other metals that may including Silicon, Mn, Ferro Mn Tungsten Chromium, Tellurium — Sulphur? — Selenium — Carbon? etc. Tu Sb Zn Cd Ag Au Pt Ir Ru Pd Ru ~~#~~ Os Pb Thallium — Co Ni, Mo & the rest — Try PbO, pyrosulphite, Sulphides of metals that will conduct

only Coat so not opaque —

Then use for Magnetism Light, also Conductivity of Current

Feby. 4 1903



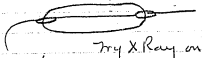
Very high Vac — small iron ring with foil wire, Balance in Bridge + Read Rich right along as Vac increases to see if any changes in Current —

Also. Wind Spool with 1000 ohms + put in Vac, put in Bridge + measure Res as Vac goes up

Also try if Rapid breaks also Reversals make any difference —

Feby 4 1903

If a Branly will work surely a gold leaf or equivalent will work by a beam light on the shadow could be used to read by also use it for XYZ Rectifier —



Try X Ray on Continuous wave in Vac —

Try jump spark points with sparks adjusted so it will not jump except in Ultra violet light shines on it — then try if any opaque thin sheets will conduct the ray that causes it to jump — also try, monochromatic lights, also proximity of chef metals Try X ray also — & thro opaque —

Feby 4 1903

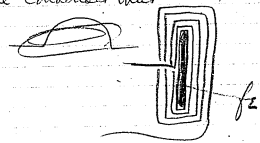
Since the Nife Storage Bat has such enormous discharge rate Could use a primary like Eltric + by breaking 1000 amp in bat poles by mere get an electric 00 henrandom that the X ray tube would give extraordinary results also Would it should make Enormous Vallage of a secondary used + a vicious spark bet balls — The number of breaks Could be 1 or 2 so a few turns small wire which might melt in 1 second (~~would~~) with 100 amp would stand 1000 or more for a fraction of a second (10) ordinary Zn Ihem — Could use it in oil — also a single Coil would give enormous results without new possibly have to immerse in Oil — But this would make it less Shaup possibly put in Vac tube would get new results in self induction would be at Minimum — This one end now were should ~~get~~ act as

Feby 4 1953

a powerful Molecular
Sledgehammer for XYZ
Waves

Remember old jumpers at Poerck
giving jumpers spark -

Make Condensers thus



foil Copper Cut thus + wound
around so that we have 10 or 15 times,
as many disks as on jumbo insulated
with paper & oil, then see
Results with Several hundred
Amperes of jumps, put in
oil & see about Etheric ?

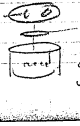
XYZ =

Feby 4 1903

If an X ray tube a molecule strikes glass then stress passes through & an air molecule is thrown like a Cannon ball into the flesh (1-2) inches then

A dish containing an acid in which the most sensitive reagent for a metal is in the acid solution the intervention of a very thin metallic plate between top of cell & X Ray tube. The metal shaved off thrown into the Electrolyte & in time give the Color reaction,

or if thrown on a platinum plate the metal would be embedded in it & after Calcining for a while put put in acid & solution metal located by reagent then will prove of metal is actually thrown by X ray



Feby 4 1903

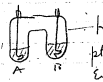
Perhaps a more sensitive test would be to put a platina plate within a hydrogen flame & then between the X ray tube & flame put the very thin metal the X ray would throw molecules of the metal against the metal & the flame would give the spectrum line, Rock salt or Lithium Salt crystalized in fine lat of large crystals could be used.

perhaps by using a hydrogen flame & metallic nozzle to Earth a platina scoop with a metal or oxide of high fusibility in it in flame that it could be used as a Brauly or X ray with Spectroscope,

Feby 4 1903

Make a small Tungstate screen the Crystals being mounted on thin dense glass by fusion, then try effect of Resistance increased or diminished by heat or Magnetism or both. Try these for other fluorescers.

There might be a storage cell in high Vacuo to get low temp oxidations



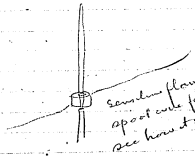
Try chemicals - high 1200 volt, current produce vacuum electrolysis — finely divided nickel in one — Try Ni_2O_3 in other, Per ox lead in one fuse lead in other — PbO_2 in one Zinc Al Mn etc in other the passage of spark or Current in one direction changes it in other direction discharges it O Combining metal gives bright light at very low temp & cold light like opals

photo

Feby 4 1903

Possibly tubes exhausted beyond X ray point will be best to get XYZ or connect with the medium free of matter, remember steel electrode absorbing residual so cried get no spark — then perhaps the 1000 amps Etheric coil wld give new XYZ ray —

Possibly above tube in powerful Mag field — also Ultra Violet from arc light,

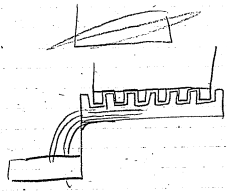


Feby 4 1903

In small Motors cents Eli

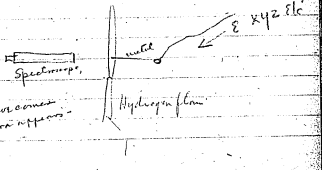
why not increase reacting surface

armature for magnetic lines thru



could double the surface + 1/2 Res.

of our gap —



When warm comes

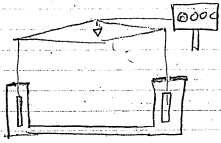
Spectra appears —

Feby 5 1903

Oxalate Uranium very sensitive light, actually a solution of Ox Ur decomposed by light giving $CO\ CO_2$ - Remarkable salt,

15/1000 perf oical frame 4X4 ~~frame~~ Window of 1/1000 Collodion 1 or 2/1000 gelatin colors chameleon —

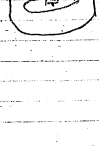
This to take place of glass dry plates to cheapen lightly manipulate as with steel Kinetograph film —



Electrolyze Nitrates using KOH sol a

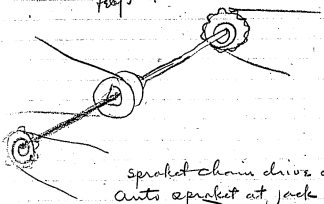
Feby 5 1903

Storage battery Cups of pure nickel with $Ni(OH)_2$ + plat or Ni wire — both about 3/4 charged — Then for 1 lamp Regulator say 2 hours to block 6 ohm of Counter + recording device — as $Ni(OH)_2$ is endothermic, results should be perfectly accurate, Fe with Hg 25% might work — also HgO alone in cooling prod with great excess fine graphite — Rafn now testing Shunt in main line + The Electrode could have double part device



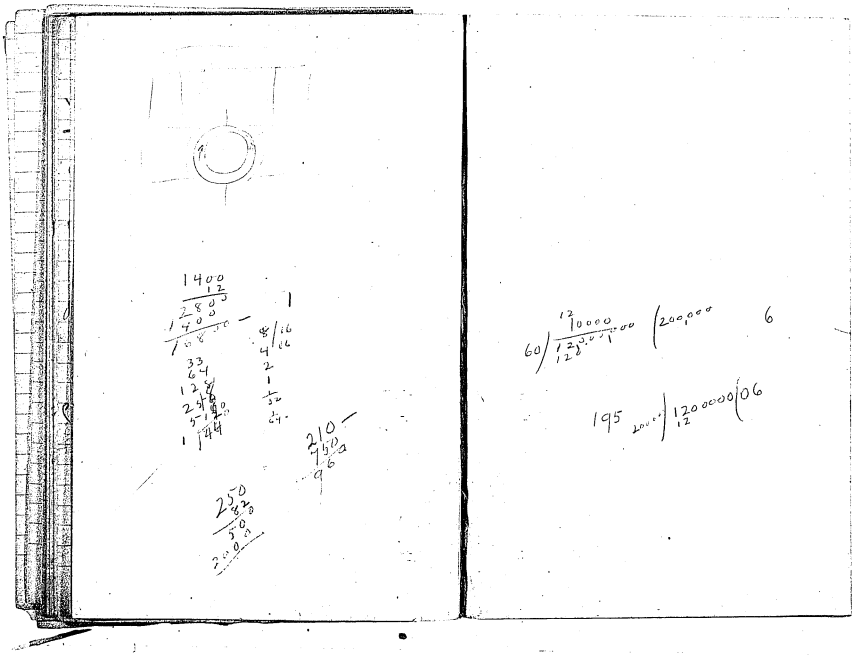
+ fine hole for wire to prevent Carbonating

July 5 1903



sprocket chain drives on
auto sprocket at jack
differential not keyed on but connected
through rubber spring to take shock
off chain =

[THIS BOOK WAS USED IN BOTH DIRECTIONS. THE FOLLOWING PAGES WERE FILMED FROM THE BACK END FORWARD.]



Photography X Ray XYZ

Iodide of Hexyl acted upon by Light

— " —

Mercurious Iodide exposed to light turns yellow then red.

— " —

Calomel becomes dark grey when exposed to Light.

— " —

Mercurious-Mercuric Iodide Sensitive to light.

— " —

Mercurous Oxide decomposed in weak light, even by pressure?

— " —

Mercuric Oxide gradually blackens in Sunshine.

— " —

Tetra mecuraimmonium Carbonate.
turns grey when exposed to light.

Mecuric Iodallylide changes
Color when exposed to light

Mecuric Iodethide easily decomposed
by diffused daylight

Phosphate of Methyl turns
grey in Light — Watts 993 3rd Vol.

Possibly syrian asphalt on glass
in Chlorine would be acted on by
Light also film Chromic acid
on it where oxidized become insol
also gelatin surface in Chlorine
" " " with Al_2O_3 put
on surface + exposed also Sodium
per oxide Hypochlorite Ca
permanganate Soda Co_2O_3 etc

Acetylene either pure or mixed with other gases sometimes detonates with Chlorine even in diffused daylight. Whether either is in excess, products are HCl + Carbon

Bromine even on foggy day unites with Acetylene = after a time explosion occurs

Allylene is acted upon by Bromine in the shade.

Allylene di-Iodide turns brown in light.

Iodallylene C_3H_3I Crystals inch long Very sensitive to light. 1st Sup Watts page 97+98

Benzylene Bromide, is an oil, changes color when exposed to light.

Orthotolyl Mercury salt crystals decomposed by light, ditto the Lead salt? —

Nitrobromoxylene ( ) turns red when exposed to light. 1st Sup. page 294 —

Diamidomesitylene turns red when exposed to light Crystals — 1st Sup. 300.

Anthranilic Acid or Amidosalylic A. The Lead salt turns yellow when exposed to light.

Paranitrobenzyl Alcohol Crystals turn yellow in light,

Several double Iodides of Bismuth (1st Sup. 348) are quickly altered by light especially violet light, The surface altering Bi Iodide does this also.

Solution of Bleaching powders or pure Ca Hypochlorite gives off Oxygen in light,

Chrysogen solution turns colourless quickly in light, 1st Sup. 459.

Acid Potassium Vanadate in contact with organic substances turns blue in light, 3rd Sup 1233

Oxalate Mercury sensitive to light & Radium emanations,

Phosphenyl Di Bromide liquid turns yellow in light & decomposes depositing a red substance,

Benzyl di-selenide, Crystals, Exposed to Sunshine turn from yellow to red,

Ammonium Benzyl Selenate. White crystals turn black on exposure to light,

Conine Hydrobromide turns red when exposed to light.

Tetranitrodinaphthylmethane Liquid turns yellow when exposed to light,

Dioxythymylethylene Cryst Easily altered by light,

Benzene in sunlight in presence of H_2O oxidizes many organic compounds (neutral) to acids such as Benzoic Toluene Mannite, Sugar glycerine.

As mediums for films on glass for holding substances acted on by light
Albumen, Agar agar Gelatin
Collodion Paraffine Dammar Varnish
Rosin in Alcohol to the resins Aluminum
Trihydrates Gelatinous Silica, Silicate Soda
Gum dextrin Tragacanth Starch
Gluten Balsam Fir Gutta Percha,
Rubber, Balata, Mastic Varnish,
Amyl Collodion, Shellac Varnish
Iceland moss, Fish glue

Plates of all the inorganic acid salts containing different metal with Silver such as Tungstate, Chromate etc.

Cuprous chloride very sensitive to Light
1st Sup 493 — 3rd Sup 566 —

Tungstic acid in presence organic matter
reduced to Blue Oxide By Light.

Iodoform dissolved in Bisulphide of
Carbon is excessively sensitive to Light
Colored violet owing to liberation of Iodine

Uranyl salts highly sensitive to Light.

Gold Trihydroxide decomposes and
gives off oxygen when exposed to
light,

Aurous Cyanide must be made &
washed in dark, very sensitive to light.

Chlor-auric Acid sensitive to light,

Note, Possibly Iodide of nitrogen in gelatin etc on plates might be decompd by dif rays ultra red for instance so could photo in dark, or X XYZ

Formate of Silver decomposes when moist, even in the dark. Formate of Mercury does the same thing Crystals decomp by pressure, possibly radiant heat decomposes it in dark.

Potassio-Mercuric Oxalate sensitive to light and heat.

Ammonio-Mercuric Oxalate "

Diazonitrophenol yellow powder turns red on exposure to light,

Also Diazonitrochlorophenol.

Platinochloride of Diazobenzidine
Crystals when drying turn brown when
Exposed to light,

Hydrobromate of Azophenylamine,
explodes violently by heat, friction, or
pressure,

Nitrate of Azophenylamine, explodes
with terrible violence exceeding
fulminate of Hg or Iodide of Nitrogen
explodes at 100° friction or pressure
Causes explosion,

Azobromophenylamine is a very
dangerous compound, the slightest
pressure or contact with a rough
substance causes it to go off with
fiery explsn exceeding Azophenylamine

The Chloroplatinate of a Chloranilin gives cryst. that turn violet when exposed to light.

Ethylaniline decomposed by light,

Ethylidene-diphenyl-diamine cryst gradually turn red when exposed to light,

Calcium salt of Nitrocumizic acid gets darker when exposed to light,

Ferrocyanide of K solid & liquid slowly decomp to Prussian blue by light.

Ferridcyanide of K very easily by light

Nitroferricyanide K. changed by light

Nitroferricyanide Sodium more sensitive to light, giving prussian blue

Dry HgCy in chlorine gas decomposed by Light

Evidently there are numerous substances that can be put on glass or metal plates within a cell with chlorine, & photos taken in Camera, also XYZ + X Ray

Cyclamin turns brown when exposed to light, a solution in a sealed tube exposd to light deposits a white solid.

Digitalic acid affected by light

Many organic substances prone to Oxidation at slightly raised temperatures in the dark, not oxidized but when at same temp are exposed to light they are rapidly oxidized. Especially Indigo blue, Turmeric, Color of flowers set bleached. -

Ericinone, Cryst, affected by light;

Iodide of Ethyl colorless, if allowed on Hg & exposed to light it decomposes red Iodide of Mercury formed liberating Ethyl better metals than Hg does it. This is good substance to experiment with.

Monochlorinated Chloride of Ethyl — Chlorine dissolves in it abundantly & there is no action in the dark, but when exposed to light, a violent action starts & torrents of HCl come off. Evidently light has some connection with Chlorine in Chloride of Silver in regular Photography

Chloride of Gold in Ether deposits gold when exposed to light.

Ethylene-Dichloride of Platinum, (solid) becomes brown or black when exposed to light.

Fulminating silver blackens when exp'd light

Furfurol turns brown in light + some even in the dark.

Gallotanic acquires a yellow color on exposure to light.

Trichloride of gold decomposed quickly to gold when exp'd to light

Auric oxide reduced by light

Guaicum changed by exposure to light especially violet light.

Acid chromate of Quinine rapidly decomposed when exposed to light.

Racemate of Hg colors on exposure to light.

Hydrocyan-Rosaniline colorless, turns rose red when exposed to light

Rosolic acid — Rosolates easily decomposed by exposure to light losing their color.

Ruthenic Tetraoxide soluable in water rapidly decomp when exposed to light.

Santonin turns yellow on expo to light
Dichlorosantonin "

Sapan wood or Brazilian, sensitive to light

Ammonio-mercuric Sulphite decomp to Hg globules by light it even decomp in dark in a sealed Tube,

Meta ~~napthy~~ thiosulphurous acid the Lead salt turns brown when exposed light

Chloride of Thallium decomposed by light

Thymöil a product of Oxidn of Thymol decomposed by light.

Thymol in chlorine gas sensitive to light

A certain protoxide of Tin blackens in the Light.

Acetate of Ethyl in chlorine in sunshine Explodes.

Aqueous solution Citric acid in chlorine in light changed to Hexachloroacetone.

Iodide of acetyl in presence of Hg decomposed by light.

Iodide of Monowallyl turns yellow in light.

Sulphurous—Iodotrimethide (p. 885 Lastral Watts.) Crystals quickly turn brown on exposure to light.

Mercurious Benzoate turns light yellow in light.

Cacothelene product action Nitric Ac on Brucine turns brown in light. Vol 1 700.

Sulphide of Allyl precips Hg turns black in light, J Watts Vol 1 1144

Arsenate Copper + Ammonia decomp by light — Vol 1 381
ditto arsenate Cu —

Heat Photo — Dimercurous Arsenate changes color by heat,

Ditto Sulphantimonite of Stibethyl powder,

Chlorine in foggy weather acts on Acetic acid to form Monochloracetic A.

Solution of acid chromate of Potassium mixed with Ammonia or Alcohol deposits brown sediment in light — not in dark.

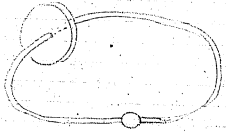
Phosgene gas action Chlorine on Carbonic Oxide in light, forms Chlorocarbonic acid.

all in 619 book

Notebook, N-03-02-26

This notebook contains dated entries from February, March, May, and July 1903. There is also a 2-page entry from February 1905. All entries are by Edison. Included are notes and drawings pertaining to various experimental projects, such as the hardness and composition of phonograph cylinders, phonographic recording apparatus, etheric force and "xyz rays," and storage batteries. The pages are unnumbered, and several pages have been removed from the book. Approximately 20 pages have been used.

Feby 26 1903 –



An incandescent light in center of a Coil, with several Wheelpole arc. Strings, current in coil, Spectroscope on Lamp – idea is that Combustion in battery will give lines spectrum in the Continuous spec of Lamp –

For hand dipped record — Feby 26 1903

Use hardest Coal Tar pitch as base,
also " Shellac "
Asphalt, Carnauba with little Rosin, or Mastic
for receiving by Sodium Alcoholate, the
wonderfully light —
Caramel or Higher phenol make good
hard record, fused Nitrate K —

Dry Coating made of Matrix with
very thin skin Collodion (10) amyl Acetate
drops, then when ½ dry pour in phenol
paris or other setting Cements
The fused drying in Vacuo & heat
will shrink celluloid & Record
Can be removed —
Or use thin skin & pour a low
melting point material in that,
will stick to film & on shrinking
will detach it & permit record
being taken out —

See if scintillations of metals affected by Coil field, magfield, X ray ~~etc~~ also high temp —

March 31 1903

Trihydrate of Aluminum is I think the finest powder obtainable — for mixing with other things for instance mix with pure and thickly transparent soap to make cut powders — also with a slight amount binder — press cylinder etc —

It will be necessary to wash by decantation or funnel with the purest distilled water obtainable otherwise it will dry lumpy.

If can get distilled H_2O pure enough the powder should be of infinite fineness — Try powder when obtained as Micrograph — Can't use KOH on it but possibly will work on high voltage Currents without using — possibly 1% KOH would do in dissolving as $KHAlO_2$ not decomposed when weak (is decomp by H_2O like Zincate K —

March 31 1901 —

It looks to me as if Zinc with KOH would be better than KOH alone as Zn would be the reducer of the Fe without K ? ? — OH from the Zn OH would oxidize the Ni without drawing out KOH from the grid — The idea being that Zn OH decomposes easier than KOH — or always. But the Fe —

By precipitating Trihydrate & washing thoroughly the pulp could be mixed with pure soap & then dried & dissolved in alcohol perhaps Trihydrate could be got better purer perhaps trihydrate would decompose & the lump soap must be dried — perhaps after washing trihydrate perfectly in distilled water the water in filtered pulp could be displaced by alcohol then boiled with it filtered & fresh alcohol put in then dried soap and heated to make trans soap with powdery cut —

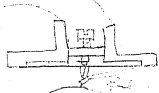
It may be with violin strings that a $2\frac{1}{2}$ inch dia can be made as stiff & elastic as 1.12 glass now used, We could get more power thus very by larger opening in end of small part of funnel — both the one inch & $2\frac{1}{2}$ should be tried — Use in small men Silkworm gut as used on fish lines —

May 30 1903

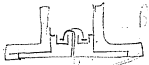
Recent experiments show that cobalt is wanted on plums to get better machines as a very hard cylinder instead of the Reg or softer. One that would do as hard as dolphin would be ok but it is difficult to get any as hard. Experiments on India 50% of Cam and 50% appear to have it but it is not hard enough. In addition of Damascus machine with Cam and Bar. The reason why hard cylinders are better is that on account of the hardness the strong waves and momentum are checked by the hardness of the way and a truer wave is recorded. In addition the regularities Cam break the cobalt carries the overtones are recorded because the chin can be broken slightly & the work done is less. Tomorrow am going to try & stop the inward movement of diaphm to a great extent as suggested so ? Cam break very lightly — going to use a seam with Rubber band gently inclined Rubber Cam used bird

May 30 1903

my equipment so that is no stored
Elasticity & then make it work
not resistance to the vibrating
system on both sides always for.



use follower or pressure foot & trick very light &
then a great Solution go deeper —



to prevent jump out

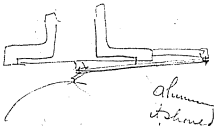
Tracked off

old way

new way

Tracked light by unclear record or Complex
damper

May 30 1903



Alum Sol) shaped to make hollow tube to light in

or made of film dope on glass tube,

July 30 1903 —

From ~~the~~ trifling experiments with 20, 35 & 45% of KOH it looks as if the insoluble superoxide of Nickel was more soluble the stronger the solution & think it decomposes in weak solution. Therefore as the many experiments to obtain good deposits of different metals were tried in 20% KOH. The experiments must be all tried over again with say 50% KOH or NaOH. There is a pretty big job — Try Bismuth, Cadmium, Molybdenum, Uranium, Vanadium, Tungsten, Iridium & also rares used by ~~Edy~~

The purer we get our KOH we free from Carbonate etc. the less the economy in chg. Have good try a part of Carbonate in KOH

Feby 13 1905

200 HP –

1 gram per amp-hour –

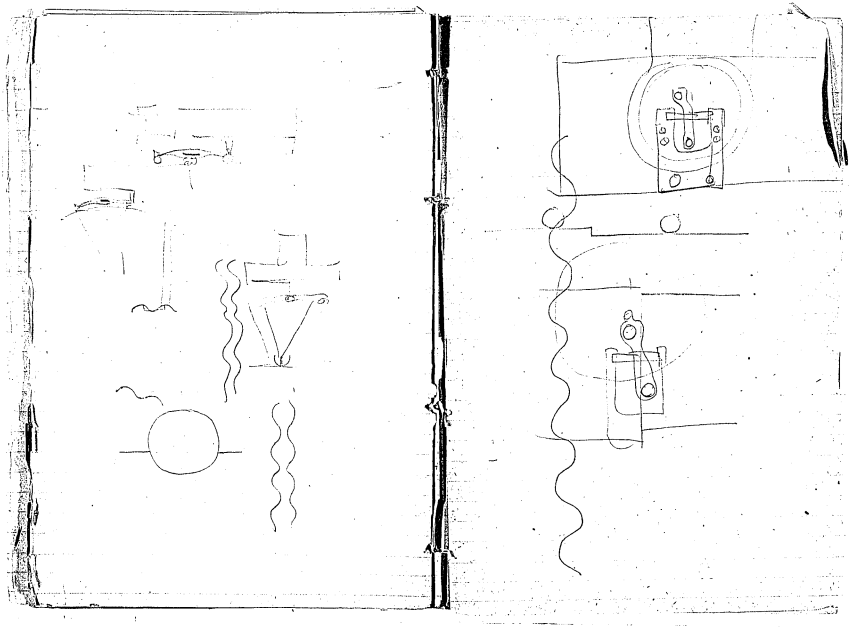
$$2.5 \overline{)750} \; 30 -$$
$$\quad 750$$

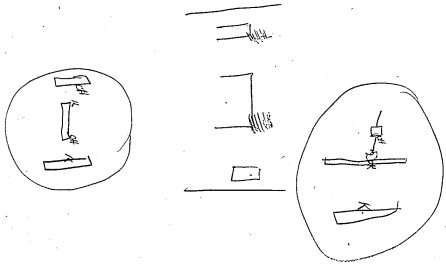
1 oz per HP Hour –

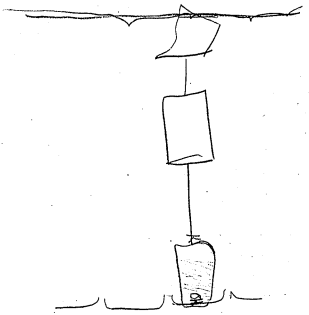
$$24 \overline{)16400} \; \text{HP Hours}$$
$$\quad 64\cancel{0}0$$
$$\quad 48\cancel{0}0$$
$$\quad 16$$

$$\overline{)260} \; \text{HP}$$

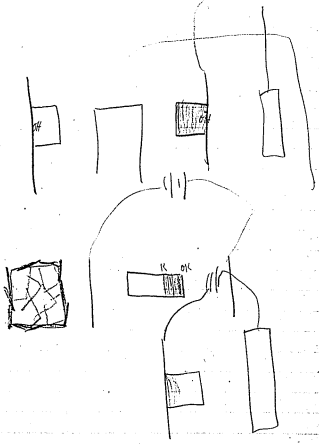
Bismuth,
Cobalt,
Copper
Sulfide Ni
Vanadium -
Dysprosium
Lanthanum
Nitrides
Silver
Cadmium -
Erbium
Thoria
Terbium
Molybdenum
Tungsten
Uranium
Yttrium

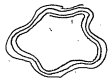


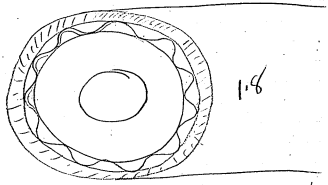




3 $\overline{)50}$ 16=



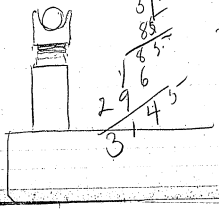


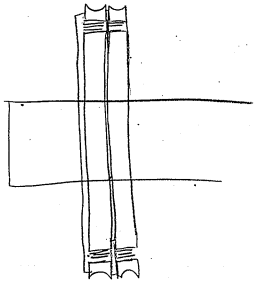


54

37
85
85
16
29
45
31

30000 | 5400
3000
24000 | 1.8





900 inches —

1.3/1000 — $240

1000 — 1.3/1000 inch

1 — $240

1.32

30

1302 | 1728 (1.32
1302
7260
7260
3540
3540

1300" 1/1000 240 —

1/100 of 100 2.40

1/200,000 1,20

1/5

1.300.

0.650 — 120 — 1/2

.325 — 60

.1625 — 30

.08125 — 15

.04062 — 7.50 cents

.02031 — 3.75

.01015 — 1.86

.00507 — 93

.00253 — 47 cents

8

0000.00253

36
28

1/30 of 00010

3

1 Hour - 50 ft min. 30 wide -

125 inches 1/1000 thick for .0001

1000 cylinder - 125" 35 lbs -

about 3300 cylinder for 200 cells -

144 183 feet .030 - 92 06. 46 - .120

9 1296" 24.250 -

1296 1000 thick

109 or. 35 / 1250 (35
109
20

12 130 inch

2.58
2.00
5.16
4.50
6.60

60 feet min 450 / 5160 (120 9

50 feet min - 30 / 36000 (1200 - 3 3
30
6
0

12.00 3
360.0
3.70.0

50 / 360.0 (72

1296"

69 / 3500 (25" 1/1000 thick
200 / 3500 (35
80.0.0
35
11
1.83

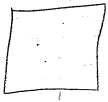
125

18 in 24 hours - 1.5 / 3300 (183
180
149
60

80 permin

80 / 3500 (43.1
320.0
3.0 35 2

8 hour

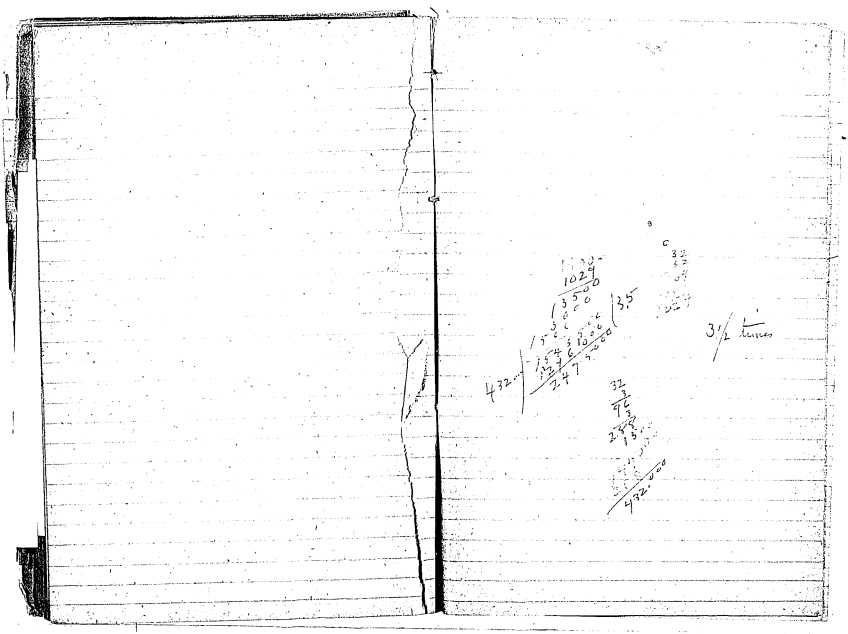


6 - X 1½ 12 X 7/10000

24 - 35
48 17

60 thousands 1/10000 -

30 -


3½ times

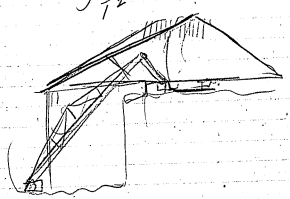
.40
16) 28.80 / 1.75
16.0
12.2
1.80
8

175) 500 (2.85
350
1.50
1.40

1 25

2.85) 1000 (350
855
1450
1425
25

5) 350
20 (1.4
300) 420
300
120



Giants – 5000
4 ft – 5000
Hoppers – 35000
3 Rolls 15000
Conveyor 3000
Magnets (Coby) 8000
2 Ships – 25000
Magnets – 15000 –
8" Furnace. 25000 –
Bldgs 25000.
Shovels 22000
Guidon 6000
Cars loco. 5000.
169000
100000
Correction 269.000

300.000.

1200

15
4000
60000 –

4000
20
80000
65) 80000 (1230
65
150
130
200
2700

2400 –

350
175
175
122 5 –
300
367,5

350 –

8.
20
8

150
15
750
150
225

800 –

15
800
000

15
4000 –
60.000 –

800 –

di. Ba. Nu. K. Ca. Br. Bx. Af. Mq. Cd.

Fa. Co. Ni. Cu. Oq. Hq. Mw. Cr. Mo. Wo. Pb.

Ar. S. Te. Se.

Fine steel	2.75 100 — 55c
Nickel 1.55 lb 254 quantity	12 — 52c
Quantities [illegible]	[illegible]
Can	10
Tops stock	6
Rubber	100
Extra	25
	284

Notebook, N-03-02-27.1

This notebook covers the period February-March 1903. All entries are by Edison. The book contains notes and drawings pertaining to various experimental projects, such as the hardness and composition of phonograph cylinders, x-rays, etheric force and "xyz rays," and storage batteries. There are several pages of notes relating to the use of motograph cylinders for the amplification of recorded sound, with a specific reference to the work of Daniel Higham. Also included are notes regarding Edison's theory of matter, electricity, and the ether, as well as scattered drawings of recording and reproduction apparatus and phonograph horns. A notation from April 1903 indicates that some of this material was recopied into a "big book" (Miscellaneous Notebook, E-4297). Inserted into the book is an undated note from John F. Ott concerning the manufacture of storage batteries and other matters. The pages are unnumbered, and several pages have been removed from the book. Approximately 60 pages have been used.

1 Geiles Barium refinery - Vanadium Cr Mo W
in 50% ROH - Separing -

2 { Try 1 pt Crude R to 20 pts ROH
3 " "
5 " "
4 test for changing Unalloyed -

3 See what [illegible] in 1% ROH Ro
to see if MoO_3 [illegible] -

4 Daley make inspector for [illegible] selling -

5 Royal Oxalate Wheel 10 p one pt in dissolved 45% Ro

6 Phone wires & silver plate 5 lbs of powder.

7 Rosse Sulphuric Top Can from Sulfide Nickel - pollution

8 Pottin dry [illegible]

9 = 080 Bisphere from cooler -

10 = 2 Pot [illegible] Rep dies -

11 - Better Phone test down -

16 5000-

24- 60000 (2500-
144
150

24
2500
24
10000
5000
6000

2400

2500.

150 150
24 24
2/7500
3750

36
2500
36
5000
5000
7500

3750
24
3000
2500
7000

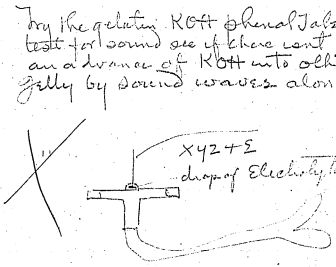
16- 18 17500

4. 16-

3750
16
2500
0

Feby 27 1903

Try the gelatin KOH & heat & Jabin test for sound see if there can be advance of KOH into other jelly by sound waves alone



Will the spectra be any different if Ultra Violet light from arc lamp shines on sparking points - try on + off -

Feby 27 1903

Things to try for a hard record that can be melted & worked by dipping process. Bases to Manipulate,

Hard asphalt, something to lower M.P. shellac etc.
Very hard Scotch Pitch possibly work in [illegible] distilled product
Shellac,
A Rosin soap of a non alkali metal that can be melted,
Caramel & higher.
Residue from distilling Stearine Pitch

Feby 27. 1903

How would wet clay cylinders recorded most answer? Try Cobaltinitrite also Colloids nearly dry. Silica, Ferric hydroxide, Trihydalumina, etc. Coated plates over a surface 1/16 inch of the Colloid, &c.

It is possible that a very good Concentration Cell could be made by Alkaline Ferricyanide + Cu_2O with wires —

Possibly photographic coated film lation by red or yellow light if the light passed through a Vacuum or a strong field or strong diaelectric field or the plate under these conditions or light pass through a Coil of wire with great amperage — or at right angles to an X ray or through a space strong

Feby 27 1903

of radiant heat in line & at right angles — also plate heated up to 212 —

Will X ray affect a Thermo, cold or when heated one end, —

Try best thermo in very high Volts —

Can it be that the Mass of a Zinc Electrode will affect the Voltage or amperage —

Every magnetic ckt & coil ~~has~~ has its natural charge & discharge time if there were several coil rings with small coil around Each ring & all in line, & on Each ring a larger coil with Resonator or fork in tune with the extra coil a fork may its will be a good acoustic telegraph.

Feby 27 1903

Will X ray passing through a sheet of iron within a coil give a kick in galvanometer

Is rock salt plate affected in its heat Ultra Violet etc by Elec Stress magnetism X ray, or monochromatic light

If Radium is the fluorescent to an unknown ray which pervades the universe would it lose its fluorescence if placed in a box of say lead one foot thick

X

Since a Nernst solid oxide becomes a conductor at Red heat without melting why may not a battery be made with the solid electrolyte & other applications

Feby 27 1903

A fresh theory to work upon is that all matter which gives off Ether

Pulsings or deviations in Electrolytic displacement the Ether volume aggregated (12) all metals displacing the Ether in mass but not as single atoms, as in compounds —

In a closed ckt with battery, The Zinc displaces a bulk of space of Ether equal to or thereabouts to itself + this produces a transverse pressure around the Zinc when the ckt is open the pressure is carried around the circuit to the open ends of the wire —

If now the electrolytic conditions are favorable there is a great tendency for this pressure to equalize on closing the ckt, the ions form compounds + the pressure is continually equalized until all the Zinc is changed, the pressure then

Feby 27 1903

becomes normal of the Ether — in the act of passing around the that movement of the Ether is such that there is heat given off for the reason that no metal Entirely displaces the Ether a portion being connected therewith hence when the Ether waves pass over the wire the matter of the wire also partakes of the movement & thus results in heat, if ~~the metal~~ the metal absolutely displaced the Ether there would be no resonance in the wire & vibrations of the Zinc Combination which probably give waves of 100 MM per sec would go on for ever & give Current probably not forced for the Ether must have some Resistance

~~[illegible] the Silt [illegible] Magnetic Lock~~

Metals which displace the Ether the most give the greatest

Feby 27 1903

amount of energy on electrolytic
Combination
Not the greatest Voltage
but greatest total W-Hours
(542 p 50)
Migration of ions under Electrolysis
is only an incidental phenomena
There is no dissassociation of a
Compound except by the Ether waves
in passing from condensation to
normal decomposition the Compound
& this decomposition serves to
provide Conditions for the Continuing
of fluid Equilibrium —
On decomposition The reason)
the O goes to the Zn & H to the
other pole as S^{+} S^{-}
It is the reason that all the
Neg elements when solid condense
the Ether within themselves so that
on the Exterior there is less than
normal Ether pressure —
If we heat a Pos Element its
Condensability diminishes Gradually

Feby 27 1903

it displaces less Ether, per cubic
when we heat a Neg Element
it Condensed, becomes until
there are of Co has limits,
an oxide is a P Element
Combined with a N Element
if the P element displaces the
E to the same extent that
the N Element Condenses it
the Compound formed is normal
& no more energy Comes out
out of the Combination If the
Neg Element after Combs with
a P has still Condensed Ether
it can still Combine with more
P, or vice versa,

All the phenomena of physical
Nature is simply that matter
is divided into two kinds
some which displace the universal
medium & other that Condense
it, & there is continual effort
to neutralization Mass by
Motion & Spaceless

Feby. 27. 1903

+ The sun heat tend to separate these two kinds of matter + when they return to their stable state produce our Earthly phenomena of Electricity Steam power etc,

Electricity is simply a movement of equalization in a constrained circuit of the ether pressures — Combustion in a battery is simply X'ray Ultra Red waves —

(1c) waves several times slower than Ultra red, + they vibrate along the wire at right angles to it out into space. The matter of the smaller fraction the wire acts as a brace line for the vibration,

On reversing the battery The Etheric pressure waves force around the metal or P or the N element + they necessarily go to opposite poles therefore

B — Boric

CH

PH — Phosphoric

SH — Sulfuric

SeH — Selenic

TeH

Os-H ? — [illegible] — $S_2OH^{\ominus}$

Cr H

S_i H,

Sb H, — H — NH_2

Cl H

B_r H

I H,

Cy H ?

SO_3 H — HO- of all acids

HO—H — Hydroxylated hydrogen

OH

Fl H,

Hydrides

Feby 27 1903

These cannot be no decomposition,

Arsenide of X — Displaces the sulfur

Arsenite of X — " " still lower

Arsenate of X — " " possibly "normal"

Write you to try
2% $Zn(OH)_2$ in strong
Boiling

May 27 1903

One H added to Cl, still leaves it with
Condensed Ether, passing it in gas,
from Ether a hydrate $HCl\,H_2O$
& still condenses the E, if K goes in
K displacing the Ether as much as $HCl\,H_2O$
Continue it minus H, we get a dead or
normal salt, with normal Ether
pressure surrounding the Compound
within —

OH with K leaves the KOH, strongly
displacing of the Ether —

The question is, is the Ether displaced
in proportion to weight or
by bulk — or How —
figure out Weights of equal wts.
Little bulkes of dif metals in
Alkalies strongly Boiling —
then see relation wts to Electric
Conductivity in water — although
Crystallizer stimulus interference
Endummerly by making bad Contact.

Feby 25 1903.

Think it would be a very great improvement to put thin steel wires or bands between the plys of Conveying belts to prevent stretching then there need not be so many ply —

Can attraction be detected between an acid forming Metal or an anhydride and a basic metal,

With a Quartz prism & arc light might try all Solids in Ultra Red to see if any fluorescence, also, Iodine & Bromide,

It is possible that paper treated with Ammoniacal Copper solution or ClZn would remain unaffected in alkali in Battery, Cellulose dissolves in CuNH4 solution & on solidifying gives a semi trans Parchment paper, — Thos Hellmers

Feby 28 1903.

May be just the thing - possibly other compounds, (?) MgO etc could be incorporated or be solid solution -

There is certainly merit in the Ceric Oxides as deoxidizers if they can be got active in deliverence. Observe further -

Amorphous precipitates generally cause absorption heat but those robbed after being precipitd amorphous turn crystalline, give off heat, one about equals other perhaps X ray tends to make crystalline salt amorph as they change from one to the other using Ewish So a very little oxidation of vibrant would likely bring about the Result, So Carbonate is precip amorph absorbing 400 cal then it changes to crystalline giving off 400 cal - could it

Friday 28 1903

Yet that this has anything to do with Mutoyk action. The two best are $CaCO_3$ & $SrCO_3$ both change from amorph to Crystalline after phosphor = If found any other note it = May be Compact Vibrates: the $SrCO_3$ from amorph to Crystalline & the other that make changes of friction. There are numerous Salts that have this property = S etc, Citrate of Strontia = HgI -

Citrate Cal

Neutral Quinine has the power of Carrying a abundance of finely divided particles in Water such as India ink - Charcoal Cinnabar fine earth ground fast of plants, these floating in the Water, move about & do not subside by adding neutral Solution of Quinine Even in small quantity - Alum does same thing - but more powerfully

Feby 28 1903

Lecithin of albumen treated or Quinine substitute the $NaOH_2$ at works —

Lead Citrate precipitate from Na Salt by Excess $Pb(NO_3)_2$ melts on boiling liquid to a kneadable substitute +

Room temp sol alcohol & triumph —
also Room temp of 1 lb of 86 sol alcohol — Make — must be neutral
it very probable that, some good results may be obtained —

Room or warm alcohol treated with Na amalgam from a white hydrocarbon acid which melt 160 C & form crystals —

Feby 28 1903.

Substances which are precipitated
Amorph & reflecting, turn of
Unassailable Crystalline
Carb Sr Carb Ca Citrate Sr Citrate
Ca – Citrate Cd – S.
Solns in CS – Yellow Violet fluorescent
Changes it to Insol S + the precipitate
Dichloroaldehyde Melts 1ts sup 76 –.

Feby 28 1903.

Why cant a lantern be made with PbO chem on KOH, and then nickel plated steel plates used to deposit lead on one side & pass on either only the positive 1 or 2 pass on each surface & get a negative by having an enormous number of plates, and the coeff.

---

perhaps hot solution of saturated Salts allowed to cool & crystalize in powerful X ray field might influence the formation of electric Elec Stress, Mag field. Ultra Violet for this –

When boiling sol of of nitrates of Na + K is mixed with ferrocyanide K the mother liquid within the greater pt of Pot K has crystlsd out, is then left to cool gradually give light yellow hard crystals which exposed to light for some time turns green

cross

Mch 2 1905

on the surface then if they are shaken or rubbed in the dark shine with a faint greenish light they detonate at a high temp almost as strongly as gunpowder they also decomposite, its only a mixture so use various proportions — quite pr Chem X C VII 502 — Martius —

Ferricyanide decomp by light Cu O plate Cu spongy plate, Solution Ferri K — action of light decomp + O oxdyze Cu —

Saw statement Watts = All heavy atomic wt metals of heavy density compared with those of light density + atomic wt oxidizes with great difficulty — these are more easily decomposed — This matches my displacement of Ether theory —

Mch 7 1903

Solvent power of Glycerin

Possibly some of the Records

Pts by wt	
20	Arsenous oxide
20	Arsenic "
10	Picric acid
10	Benzoic acid
15	Opalic a
50	Tannic a
40	Citric
20	Ammonium Carb
20	" Chloride
10	Barium Chloride
[illegible]	Mercuric Cyanide
10	Cupric acetate
35	" Sulphate
7	Mercuric Chloride
20	Lead [illegible]
50	K Carbonate
25	BrK
32	KCy
40	KI
50	Na Arsenate
50	Borax
98	Na Carbonate
20	Na Chlorate
50	Urea
50	Zn Chloride
40	Zn Iodide
35	Zn Sulphate

Melin 1913

Sulphur also in Bisulfide Carbon is changed by heat from amorphous to Crystal (by X ray means found the moving field std. shows —

Permanganate K is extremely sensitive test for organic matter in KOH,

For phono record masters try fine powders which dry powder by putting them in very thin soap solution say Resin in alcohol make thick mush ~~with~~ by dipping there will be probably enough for mandrel to record also try water solution viscous etc also Resin in alcohol + amorphous substance from the Bark dissolved in various solvents, possibly amorp. powders dry could be mixed with thin soap solution + well mixed

Mch 2nd 1903

with minimum amount of binder as in making briquettes & then cokate prepared in a tapering mould & shoved out & baked dry — This is good field as the record would have the advantage being either soap or precipitate, & yet the great excess of precip would make it cut powdery & sooty —

Perhaps hydrate of amorp Si etc would work with Pers in alcohol — also Ferric hydrate, Carb Strontia recently precip ought be OK — Prussian Blue in alcohol Perhaps something very much softer than Bodine Soap would be preferable — An Oleate, or a K soap — Casein,

How would pressed amorphous graphite do for recarburizing — purified by g/Na method ?

Feb 1879

Since we have CP KOH, try CuO + Zinc on it + see if any Copper dissolves

~~Should take [illegible]~~

Try precipd Arsenates for Malogh they are amorphous but by heating at 100 C for some time become Cryst

A Malograph with cylinders highly buffed of metal conducting compound with Zinc metal to pen as well as Conducting Compound should give phenomenon +

See if Reg Malogh action is diminished or intensified by heat. Try Condenser so no Current circulating — Try Constant Current circulating + then use telephone, see if works by varying a Constant Current. Try Current both directions see which works best

Mch 2nd 1923

Use in Mahogh Carb Sr then polished then wet with a solution not attacking Carb Sr then with another solution that forms a precipitate in the pores, dry & do it again till get very hard solid lice (increasing friction possibly Strontium hydroxide Sulphate will do it) put in jar Containing CO_2 or get it absorb to Solution Sr OH drying between Each washing then finally neutralize with Carb K. This will precip $SrCO_3$ + give KOH for working —

Was Carb Lithia tried for a Mahogh Cylinder —

Think that Hughes & Ross device work without leakage by running power cylinder high velocity & using pad of ~~[illegible]~~ a very bad conductor heat + Rosin cylinder at analogous Stiff - The pressure heats the Rosin & heat causes sticky friction greater than reg Coefficient,

March 2 1903

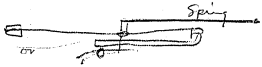
Perhaps a Motogh cylinder opened large would hold enough water to plant it
Work a week without watering
It might be not with a wedge brought up to side by push button from outside
Try the wet sponge closed chamber
the KOH shaved hard at — Com
[illegible] one hour long at
gas testing [illegible]

Possibly fusible metal 212 or
lower MP ↓ can be used as plomb
Cylinder after burning to decline
Crystals & heating just short of
MP point —

Oxide Mg Cylinder [illegible] then
wet with Zinc Chloride Mg —
dette phosphate or ZnO — dette
ZnO + ZnCl₂

Mch 2 1903

Try 2" dia for recording + put on a lightener that will lighten it nearly to limits of elasticity then have recording point do rest. Troubles heretofore is that weight did not lighten sufficiently



Mch 26 1903

Sulphur is used for [illegible] with melts about 250 limpid like water takes beautiful [illegible] + will make perfect record of the Record in [illegible]
The surface is [illegible] very hard
It actually alloys with Mercury forming a definite alloy — this shows that there is probably lot of [illegible] metal and actual alloy —

March 26 1903

[illegible] German silver — probably well worth attention
Mostly — a little metal found on gold & silver [illegible] and fex. [illegible] — good varnish being very cheap & [illegible] light spirit varnish would be very cheap — Ink powder [illegible] — [illegible] fibres if necessary — quicker & try all combs

Storage Battery KOH ~~has~~ is
Mono has one hydroxyl OH —
Dihydroxy Barium has 2 OH ions
hence, 2% of BaOH is as good
as 4% of KOH ~~[illegible]~~ if it
works not for the heavier atomic
wt of the possibly BaOH by over
blanking Cured be contained inside
& that not actually wore OH inside
to [illegible] the KOH —
[illegible] by it again & see
what can be done with BaOH

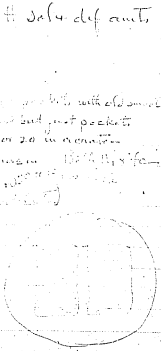
[illegible] 1903

Try 8B with considerable Zinc
Absolutely no RCH, possibly Zn [illegible]
[illegible] reduction L

[illegible] Hilly C.T. Try [illegible]
granulated aluminum [illegible] RCH [illegible] Cu [illegible]
in bottling.

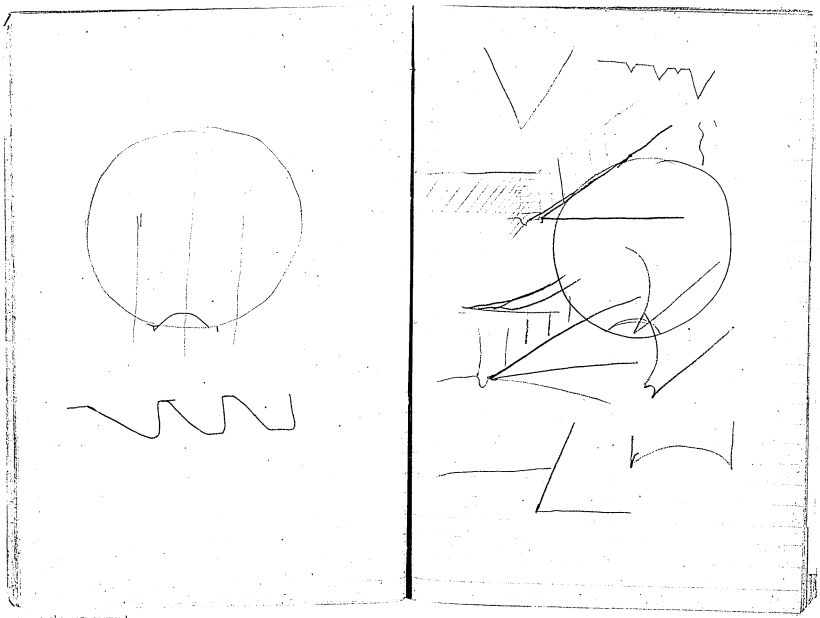
Ans. solely a Bat # Sol'n def [illegible]
of [illegible] —

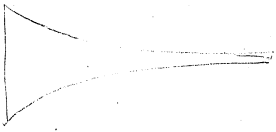
[illegible] with old [illegible]
[illegible] but not pocket
[illegible] 15 in 20 in [illegible]
[illegible] with [illegible]

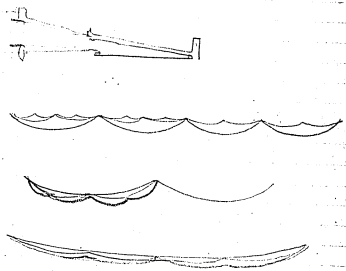


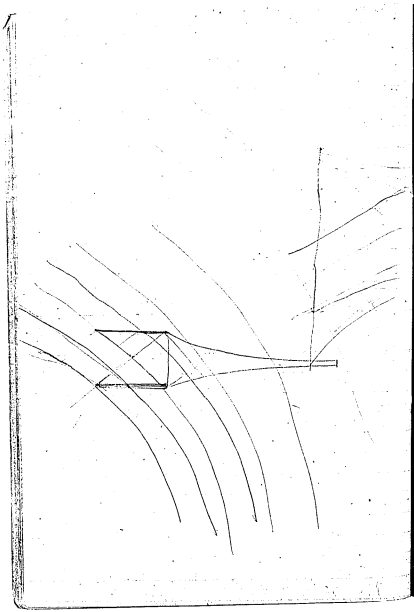
[illegible]

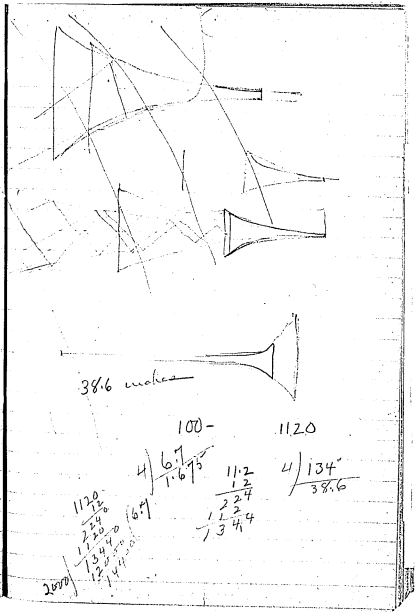
Entered Big book
April 4th 1903
to this point










38.6 inches
100 -
1120
4 | 6.7
1.675
11.2
12
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4 | 134
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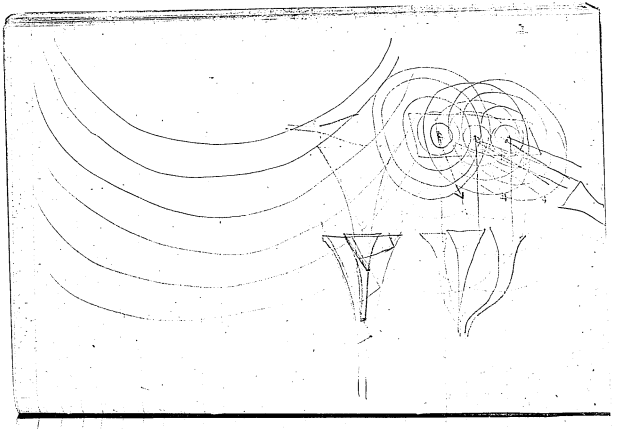
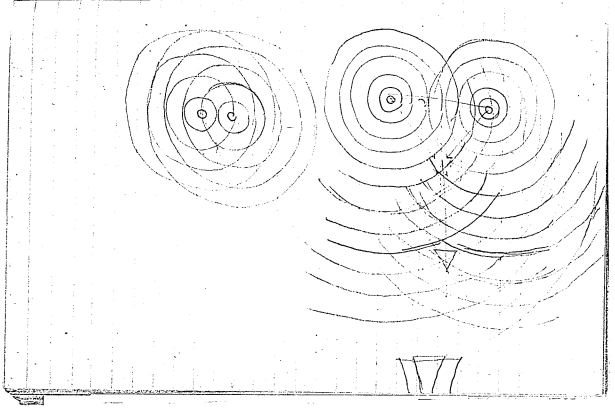
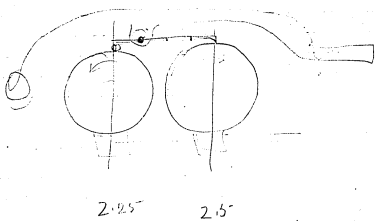
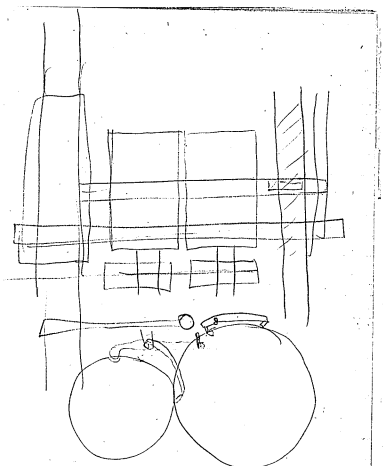
2000 | 16.7

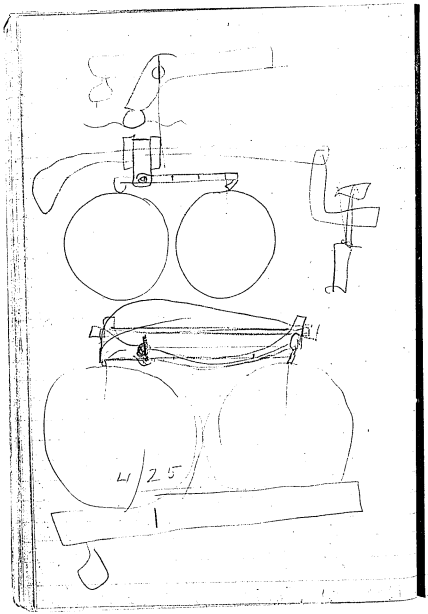




12
90
270
15
48
6
288
30
5
150
25
30
30
30
450
30
30
30
30
8
Ground
10
720
72
600
600
3600


1.5"
2.25"
2.5"

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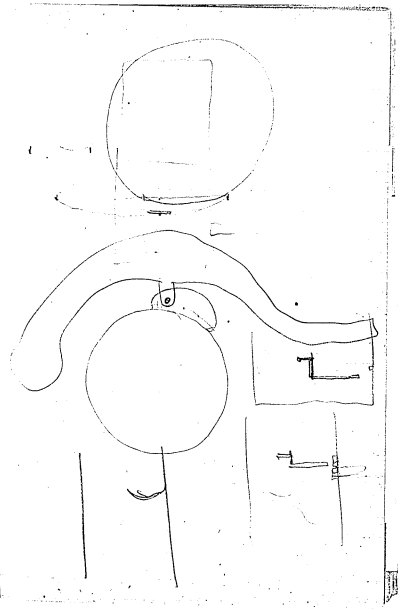
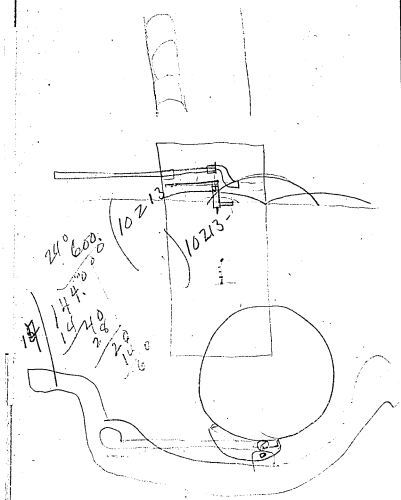




9600 10)4000(400-
40

10)1000 000(100,000
10

60)10 000(166
60
450
360
900
4

60)100 000(1600-
60
400
360

4000
200
1000-

100-

240-

2 inches —

½ inch —

4 to 1 — 300 —

240
600 vibs
144000

3600) 144000 - (40 —
144000

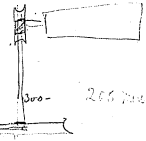
20. threads

24
3600
144
72
864000

24
3600
144
72
864000

~~24 threads~~

300 Rev to 1



300 — 208 Inc —

1000

1440) 300.000 = (208 —
288000
12

24
60
144

86400 - seconds - 1

172800 2

345600 4

691200 — 8 sec

240) 345600 (1440

240

1020

960

960

960

240

576

576

576

34560

1 flitted flake -
2 powder overflake -

814

1200

1800

Boiler

— 25

Chalk

— 14

Kiln

— 14

Coal-

— 12

Clinker C

— 6

Cement.

— 19

Land

— 4

Boiler & Air

— 9 11.

60
25
8
7
4
12
6
17
4
11
25
11
19
14
19
276

Quarry

— 25

Oil — 5

Crushing Station. 6 —

Car Belts 4

Yard 15

Loaders. 8

Electrical 6.

Ruggingmen 7

Yard

Loco — 4

General 15

Chemist 4

Machine Shops — 60 —

$ 522.00.

Steam Coal 132.00

Kilns 75.00

Oil 10.00.

Wear — 75.00

814.00

30
84
142.50
75
1400
25
3
6000
5
60
3

275 mew —

44
3
132

275
190
275.0
275
275
275.0
522.50

[ITEM FOUND IN BOOK]

1

Mr Edison

I send you a model test cell as I intend to make it up. The cups I will send to Brown Works to be made on the Monitor they can make it for one quarter price, I made the tapes and die to fit their Monitor

---

You wanted me to look up the practibality of using the half size pockets,

First they give better runs. Second the grids can be made with an extra web across that would stiffen the grid, and enable us to make punch and die for less

[ITEM FOUND IN BOOK]

2

¼ the price of present I can make it in three sections, if one part gives out it can be easy repaired, also the plates for filling machine can be made much easier as I can punch them out, if one plate wharout we can afford to throw it away this will cheapen the manfacture quite some, made this way I think we will not loose two plates in one thousand.

I also made drawing of the machine to put in side groove with all the details for some, this machine is so constructed thod we can make long or short pockets thick or thin just as you want

[ITEM FOUND IN BOOK]

3

them, and can be run at a speed of 60 revolutions per minute a small Girl can attend to it. making 36,000 pieces in 10 hours

Also making welding machine to weld test cells, I found parts for over half the machine.

The Duplicating machine Walke is putting on the lever so that both are alike, will try it tomorrow

J. S. M.

Notebook, N-03-02-27.2

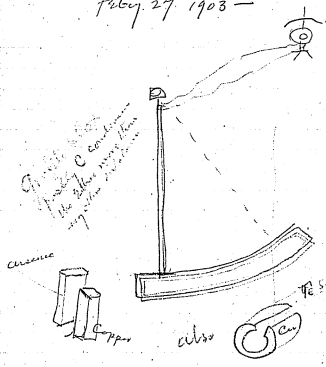
This notebook covers the period February-May 1903. All entries are by Edison. The book contains notes and drawings regarding various experimental projects, such as the hardness and composition of phonograph cylinders, x-rays, etheric force and "xyz rays," and storage batteries. Also included are several pages of notes pertaining to phonograph recording apparatus and to the recording of wireless sound transmissions. A notation from April 1903 indicates that some of this material was recopied into an unidentified "big book." The pages are unnumbered, and at least one page has been removed from the book. Approximately 60 pages have been used.

April 9 — 3 times 19 —

63

19
3
57

Feby 27. 1903 —



2 substances one Condensing the Ether the other displacing E. — Try various Metals + Non Metals acids + Amalgams in tubes, Etc at right angles + alternate also try all the Metals in U shape. for Rick when magnetized by Coil very strong

Feby 27 1903

also closed rings of a Ether Condenser + Displacer - overcome with Cold - get Kick also

and

also 2 metals one of which displaces Σ less than the other, Cu Pb — Etc.

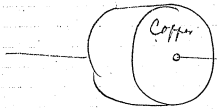
Try little Zinc hydroxide dissolved in KOH by Mfe Storage.

Run Curve on Mfe Storage in partial Vac —

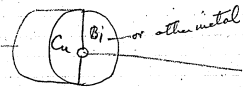
Does silent discharge give Metallic Vapor, probably pb found Records give spectrum of the Metal ⊥

Febry 27. 1903

If Tripolite proves a success for plating Try Copper plating of OK patent

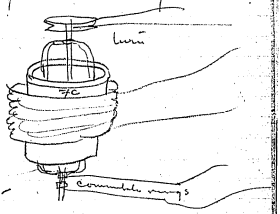


If Ether displaced by Cu a 20 lb Cylinder with 1/32 hole should effect transmission of Earth light or



Feby 27 1903

Perhaps a swinging pendulum with Cu or other metal to pass between the Conductors. Could get swings per minute when Electricity might not be given or produced only heat.

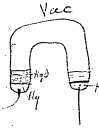


Wires that diaphragm or conductors Either —

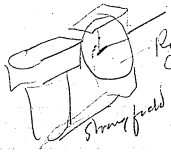
What do we get by the dev

In trying Incandescent Lamps with Cover wire + allowing it as a Conductor, have globule Hg in to increase Conductivity —

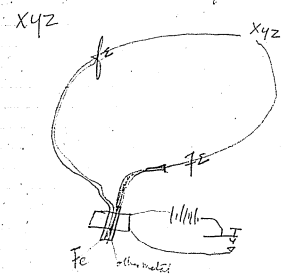
Feby 27 1903



Vac Storage,



Feby 27 1905


XYZ
XYZ
Fe
Fe
Fe
Z
pt
mag like Hermite,
X
Heat X end very
hot Z end
so it Conducts —
measure Voltage

K_2O

K H O
K H

K H O
K O H

Feby 27 1903

possibly peroxid lead in fine powder mixed with Zinc dust + put in Vac undergo slow oxidation, possibly other mixtures better, $HgO + Zn$

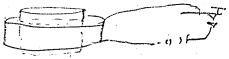
Wood Carbonized by platina heated strip in Vacuo gives no residue no Carbon? using Water decomp. pbly

Try scintillation in closed box with window - with O absorbed by pyrogallic etc, to see change in phenomenon by no combustion,
Try Chlorine, — Try Sulfides Arsenides Phosphides in alloys — Scintillations a Magfield —

As $Ni(OH)_2$ brot up in KOH fused made an anhydrous of peculiar characters. Try all other hydroxides, perhaps this will prove to be a new + useful polymerizing reagent.
Test NiO to see if it is a Compound with KOH

Feby 27 1903

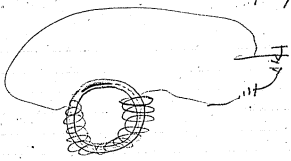
It is probable that some curious things will be brought out by this reaction, might try mixtures of hydroxides — FeOOH + Fe_2O_3 OH, see if ferrite magnetic oxide also that chromic magnetic oxide alloyed —



Cup inside coil, with def things floating on CP water, see if strong ct affects surface tension & cause solid particles to move, also see if there is any def betn Non + Electrolytes.

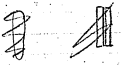
Capillary
See if Coil ct strong ct affects capillary Column Various liquids

Feby 27/903



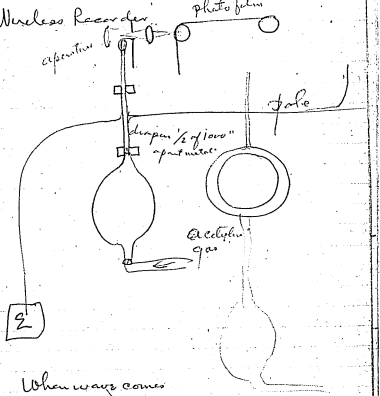
Closed Capillary tube with Hg index
Electrolytic Trouv see which effect.
Ct has no movement of Hg –

Try old Ether & Camb Sr Mattogh –
See How sensitive also with
Spark gap & Coil –



Feby 27 1903

Wireless Recorder



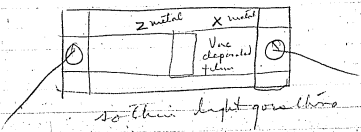
When waves comes
gas expanded light jumps up
to aperature & on photo'd –

Feby 27 1903 –

Instead of using metal diaphragm, Could use two violate spirals of wire on Mica, both in current like Electrodynamometer, ~~[illegible]~~ or when wave comes by mutual attraction, + thus drawing diaphragms together after flame –

Put in sealed tubes Bisulphide Carbon with, CP Copper reduced by H also Fe Ni Zn ~~[illegible]~~ powder, Mg powder, Al powder, ~~[illegible]~~ + set them aside for a month or so if no action, warm up too far as can in safe steam bath device allowing ~~4/5~~ space for expansion –

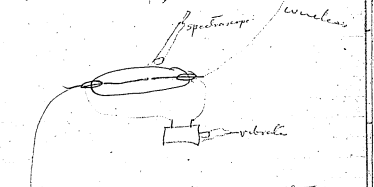
Light Thermo.



so thin light goes thro

Feby 27 1903

Deposit on glass, mica, the various metallic films that will let light through. Then put in as a window of a dark box. Let light shine into dark through film — then pass current thro film also. Ct thro in magnetic field — ct X ray — ct Kenelly light — etc, possibly one kind go thro & kill another,



Phase of Marconi action

Lines in spectrum —

Read Exchange —

March 24 1903

or Carb Strontia, clay etc in water,
Al-Chlor Bengal etc or Tripolite,
or a little Sandy mixed, will work
Gold amalgam dredge, Aluminum
Ferromil. Acetate Sr. Trihyd Aluminum —

Perhaps a revolving metal cylinder
Kept warm & painted with the
Mixture of rubber & bitumen,

Sand block in Bengal, Sand blocks
Floated Clay —
[illegible] Sand & Gravel,
Kaolin China clay [illegible]

February 27 1903

On account of tenacity of Lemonpaint
amongst soaps there will be a
tendency for knifes to clog & produce
vibration, What is wanted is a
substance that has no cohesion —
possibly trihydrate of aluminum,
Amorph Silica etc some dry —
or with alcohol with proper
percent of water in it
possibly [illegible] Iron soaps
+ Carb Sr or trihydrate Aluminum
etc would do —

Try fusible metals of various
kinds brought up nearly to
Melting point for wood cling —

Perhaps Acetate Amy [illegible]
Can be loaded with soaps etc
+ give a good material,

If an amalgam could be found
that would not be affected
it would be good possibly a multiple
amalgam Cheap but gets

Feby 27 1903

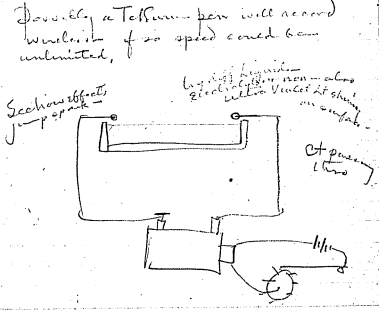
by using Chloroform, Benzol.
Ether, different Ethers, ~~[illegible]~~
~~Etc~~. Bisulphide Carbon — dissolving
different things in might by
dipping get a very fine
powdery. According adhesive —
The rapid Soap. Lathering stiffly
persons, possibly repeating bath would need
Chloride Alu in Ammonia might
Soap & Coarse filmi —
If it is possible to get a different
porous substance such a soap
left by a sponge valonia then
a repowdering point ground
rather strong would be much
better than cutting the block
it would displace the block —
The pores would be the spaces
for displacing — Then is good
direction to work on
Vac deposit would take ages
Burnishing action would smooth
track

February 1903

A bromide paper treated on very weak acid might take out enough to be borne in very serious surface problem [illegible]

Tried air on surface pretty well dried then dipped alcohol etc Quite or Bichloride in Benzol fixed on Nickel [illegible]

Possibly a Telephone pen will record variation of so speed coming from unlimited,



Feby 28 1903

In big Cement Kiln put in small Extra gun and at Clinker mixture in the Exit and to clinker up holes in lining -

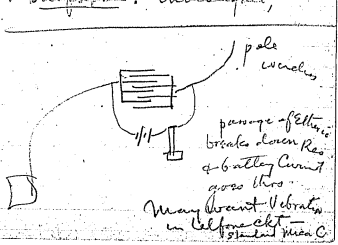
Retry all the Metal points on Carb Illumination & KOH organic - also NaOH, BaOH SrOH, LiOH also, KOH in which is dissolved ZnO CdO, PbO, SiO_3 SnO, Manganty, Th_2O, also try K salts of Cy & Br Cl, SO_3 P, Chr, B,

possibly phosphorescent sulphides give light by Energy absorbed in changing the Sulphur Molecule or rather Crystal from one form to the other,
possibly Iodide of Cmbmd with another Salt to get Calcium Crystal would phos by light,

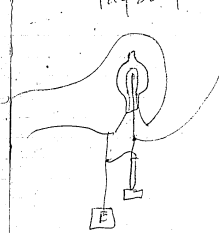
Feby 28 1903

Silver is deposited from every salt in Crystals but every diff solution gives diff Crystals — See of Phosphorescence when deposited in dark — also field X ray heat etc,

Remember those sheets of graphite pressed at Mentle under big screw press what a rapid Conductor Heat they are and burnt papers — now they should Conduct heat but slowly — possibly it travels on the surface? microscopically,



Feby 28 1905



Perhaps Telluride & Selenide of Calcium will phosphorescence also Barium —

Possibly Calcium Carbide put in Bisulphide Carbon or in other liquid & left would decompose & give Crystals of Diamond —
or boiled in Molten Sulphur in sealed tube, or heated with Dry Fe — in sealed tube —
or in Molten Boric acid,
or Dry Chlorine ?? —
also thrown in Molten Compounds

The Calcium Carbide on hot iron H_2O Salt Water Water — also in other compounds & Dry can alloy J —

Feby 28 1903

It is a strange thing that a thin edge of a broken Carbon filament under the Microscope is quite transparent — there is a lot of fine specks but the general substance is transparent.

Dr Read that Phos anhydride is a safe dessicating agt because it has other Phos Oxides volatile, this I know from Experience. Mass says Dry glacial phos acid test I agree to this — hereafter clear it —

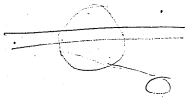
What would be effect of Immersing Carbon fil in Molten Sulphur & then bringing it up quick to Mg O C P —

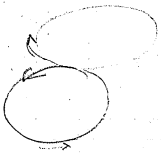
July 28 1903

Hammer says Radium changes
White to Red phos, if thin
so time R may have the
peculiar property of
polymerizing matter + this
matter depolymerizing
gives phosphorescence —

Use a shutter + test all
fluorescence for X ray + light
as well as phosphorescence
to ascertain their quickness
~~of vibration~~

If a layer 10/1000 thick
of powdered Ca tungstate
be placed between two
plates of thin aluminum
acting as a shielding
will it cause deflection
in galv when ray
is vibrating on + off
the Condenser, one plate
being the off plate for any Ray





Feby 28 1903

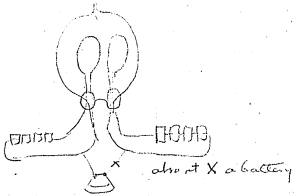
Try Al & Zn plate, also Al. & Cu plate etc —

If X ray causes air to conduct then a condenser with Al plate & charged with high voltage with a glow in it & then the X ray passing thro the Al plate & make air gap of condenser discharge — the shutter of lead — possibly telephone work —

With Wa stand get some of the lamp fit clock with preliminary furnace regulated by auto clock work to bring up in 24 hours & then Vacuum heat & sudden immersion of Sugar solution. Trying running pyrometer to various temps & times —

July 25 1903

Possibly with ~~Zirconium~~ metal in wire in Vacuum Coated flasks filaments with ~~Zirconium~~ Zirconium – & they give white light –



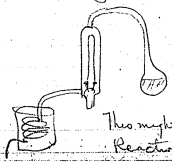
Measures Resistance.

Silicon on sticks coated flasks deposit in Vac by Cook & Crait, glow this might show up some phenom – also Zirconium – also Arsenic Te, Se, – The Si film might be studied in air & thus get film of transparent Silicon –

Feby 28 1903

I wonder if strips of Aluminum wire coated over with salts would not flash the salts & cause them to be deposited in films. This would be immense for experimenting. Give them good trial all things that distill without decomposing would work & they would probably be amorphous & give films. Those soluble in water could be deposited as a film of something only dissolved in the Hydrocarbon. The field would be immense. $ $. —
Oxides films are possible —

Here is a good field —



Distill dif things over lighted filament

also in Vacuo

This might give a new master Reaction in Chemistry —

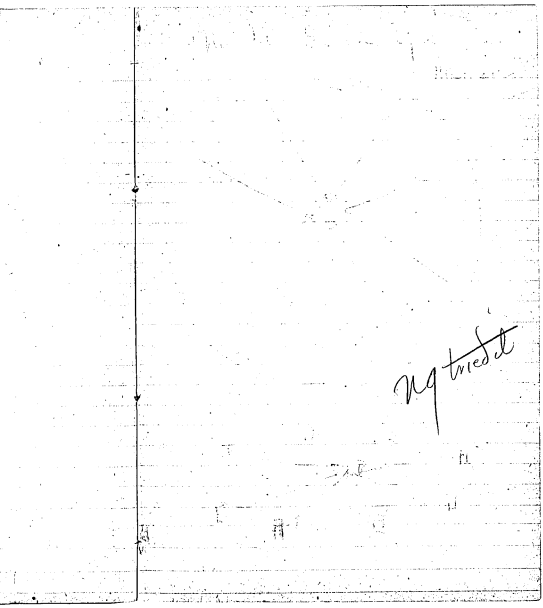
Feby 28 1903

Refract. exp. of Selenium is 14 times as great as CS — the film of Se is no longer trans after 1003 thick

Possibly the process will give it thicker — CuO is semi-metallic

If by a Camera a picture is produced on polished metal plate in an Electric light it is possible on closing the circuit the impulses would be repeated & show a picture where light struck it normal. Either oxidizes more or less or a metal film on plate is —

Why not try a lead specimen or shit a piece of lead glass & photo X ray see if any lines also not fluorescence —


negtried it

Friedtang

March 21 1993

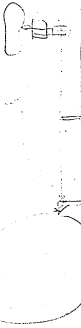
[illegible]

Dim 2 ½" dia [illegible]

[illegible]

Phono Record 21 1903

Turning



3" between parchment

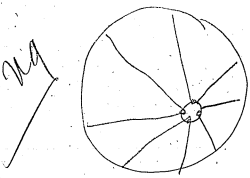
The collapse is a great complaint of Dia. yet reduces on Recording Space

Walter Miller broad stone

Frame 7 yes

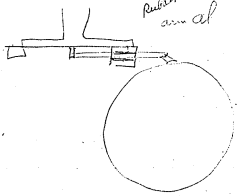
Mch 21 1903

I think that a $2\frac{1}{2}$ diaphragm would be OK for Recording if it could be made as light as glass of $1\frac{1}{4}$ or as Elastic or more so, the adjustable threaded Cat gut Vocal chords with thin Parchment is probably the way to do it. Another idea is to use diaphrams of thin Celloidin & put recording knife off Center so it would get leverage as big dia lines greater amplitude there would be no loss of loudness.



Feb 21 1903

Another idea is to electroplate
annual pan & put the
ammonia & bicarb solution -
also electroplated platinum
pan for point diff tester -



perhaps Colloids like Hydrate
Alumina, Silica (precipitation)
Prussian Blue mixed with a little
glycerine + dried often pressed on
Platinum would make good
Reforming Cylinder the H_2O
would dry + glycerine keep
them from getting hard - Dry in
Vac over H_2SO_4 —

March 21 1903

perhaps would precipitate the Colloid in solution containing proper amount of glycerine, possibly Carbolic Acid might work out just as only the Colloids would work

Mordants, how will AgCl precip with glycerine &c —

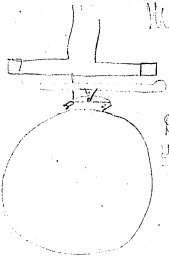
There are other things besides glycerine Chl Zn $ZnCl_2$, Chloracid —

$ChLi$ & these salts which do not become solid on evaporation, on account containing chemical water,

It is likely that there may be several precipitate amongst of Metals, & perhaps that one Metal precipitate Cyanide of — of Iron & Cobalt for. Natural Blue of Mang Alt Ni Zn, Etc —

May be some Organic salts found

Mch 21 1903



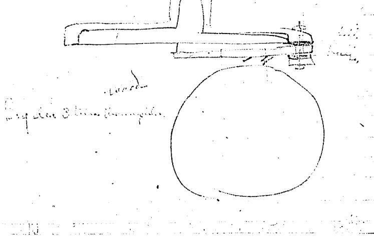
Double recorder
then double receiver
then work equal.

We want a very hard material for
[illegible] — We want then record
[illegible] motor [illegible] get better
quality [illegible]
[illegible] get [illegible]
get the quality —

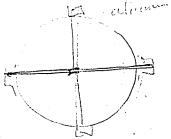
Make a strong lever as [illegible]
a test Marvel. [illegible]
[illegible] about quality.

Mch 21 1903

Try Repeater with Rubber levers etc wood etc as inertia less & so it will give & soften the sharp waves — perhaps the metal lever used is stiff & dont give & gives a sound when it strikes tops of deep undulations if used an elastic material like Hard Rubber or wood it would give a little, & soften wave also with same size would be 7 times lighter — ? —— Magnesium

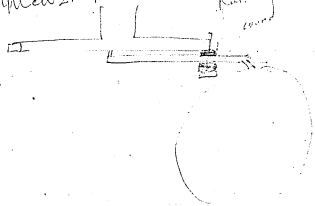


March 24 1903

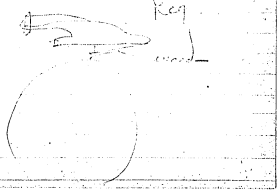


This will be an improvement,

March 21 1903



Rubber on pivot —
cement, which receives in pivot —

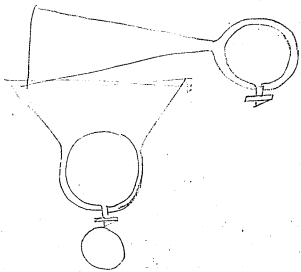


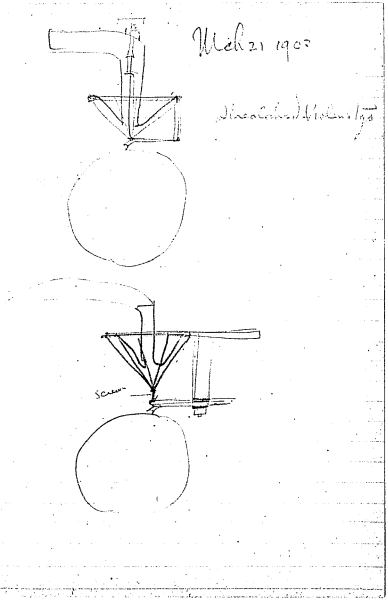
March 21 1903

[illegible] on a [illegible] [illegible]
use a Rubber balloon

Wrong [illegible] tried

The air was compressed
the whole of it, & need inflate
with CO_2.




Mch 21 1905
Screw

Mch 24 1903

We could make an undoubtedly Revival
by using solution for prints — Often in
[illegible]
the gray tints & prints

[illegible] clay are how fine can get
it for Rose Lang Publication, [illegible]
[illegible]
[illegible]
its logarithmic [illegible]

[illegible] Stannic Acetate by
[illegible] — works ok also in Glycerine
[illegible] pressure] —

See finest grain film. Amorph Can get
Cendal plate direct without Vac deposit
1st with gold & Silver — perhaps
Produce process necessary get it fine —

Mch 24 1903

There may be a good germ in using a capillary tube with say 005 hole + using a fluid with a volatile solvent, and vibrate tube up + down in liq. dia. the solution like thick copying ink dries almost instantly - if trouble get it to run could use current to drive it pro osmotically - in water solutions q. Stalve for organic - for air pressure possibly little air warm blown over to compl. act.

Solutions - Sypnan Chloroform
" Benzol
Water, Carbonate Strontia + Sypnan.
Crescent ded Sypnan.
Gutta Percha in Chloro
~~Hf + Sypnan~~ Phenol in Chloral
" " Hat.
Cark Strontia, Chloro + Sypnan (little to work)
" Chloral + Sypnan " "
" Water, gum arabic " "
Water + Gum Arabic alone
Cark Strontia, Acetate Ethyl to work

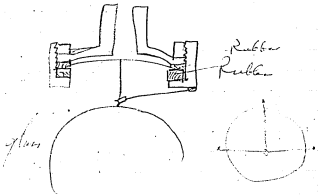
Mch 24 - 1903

Shellacked on

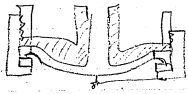
Rubber spots rigidly secured to plate for hampering — Cross of Cl. for knife —

Entered all to the printing book April 15th 1903.

May 25 1903 TCY

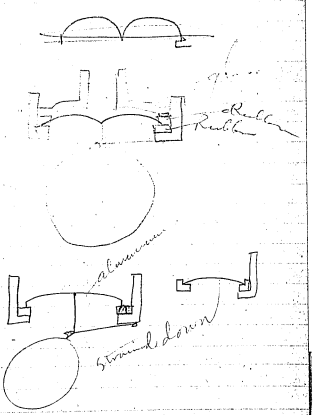


Watch glass diaphragm
Daddy blow bulb & cut it from glass
idea being to make disk more or
elastic, Place rubber to give elasticity



Convex & Concave —

May 25 1903



May 25 1903

It may be essential for obtaining good results if by a little battery to have some acid radicals in solution to stop formation K peroxide or superoxides oxides of Ni which decompose acid and formed give factitious readings

62
990
558 500
277 091 000

2.790 080
2 38.000
25 000
3.053 076
75
15 265 400
21 371 560
228 981 000

15625

4
1.25
1 25
1 25
6.25
200
200
400

1250
1250
6 250
2 500
125 000
1 562 500
3 781 250
3.910 625
95 312 500
781 250
9.765 625

62
62
124
372
3 844
62
7 688
230 625

62
125
125
1 562 5

4 | 22 800 000
3 | 5 700 000
1.900

250
100
25 000

62
75
4 34

Lwn 228 981 000 cm Red. To 1.900 000
9.765 625 dia

15625 | 4000
3 125 000
7 812 500
76 125
25

62
62
124
372
3 844
1 500
192 200 00
3 844 000
576 661 000
3.459 600

16
16
96

62
186
4
744

16
256
1 500
1 280
256
3 841

384 000
6
2.304.000

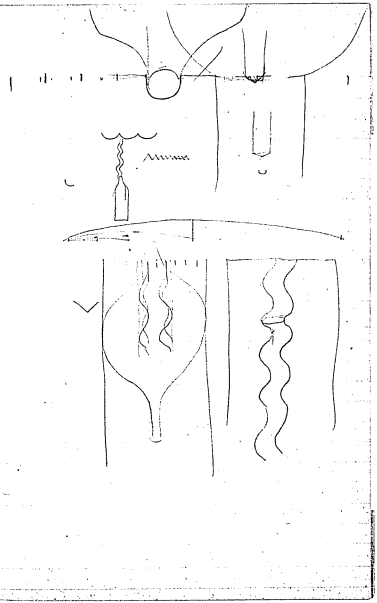
230.400

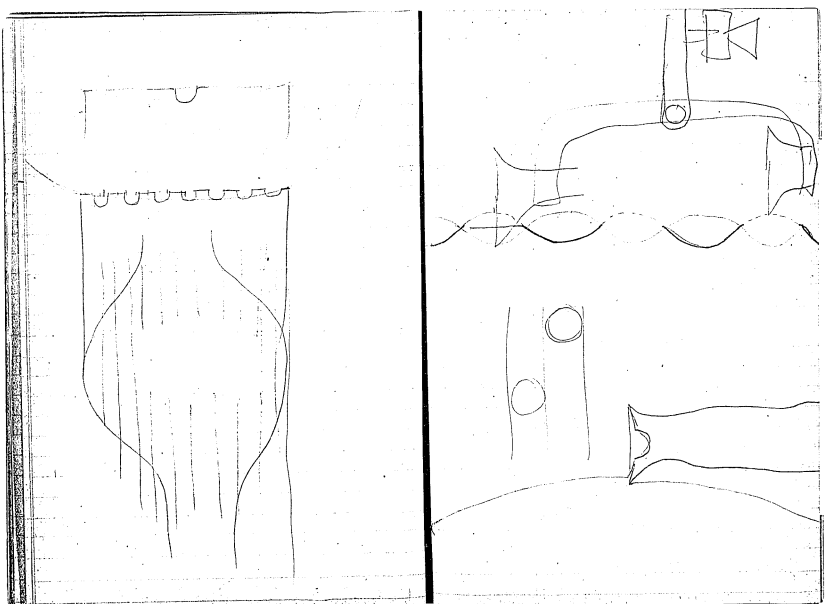
3 460 000
2 790 000
670 000

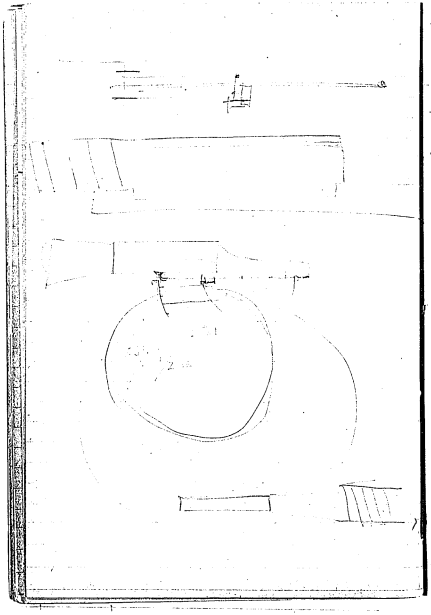
180
4
720

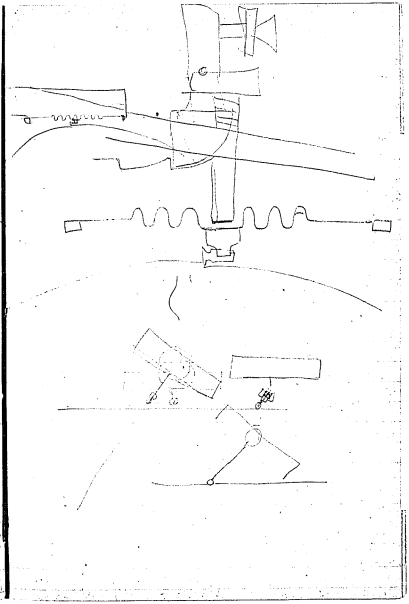
1 500
800
1.200 000

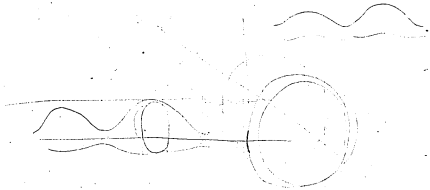
744
1 500
372 000
744
1.116 125
558 000 000
223 200 000
2.790 000











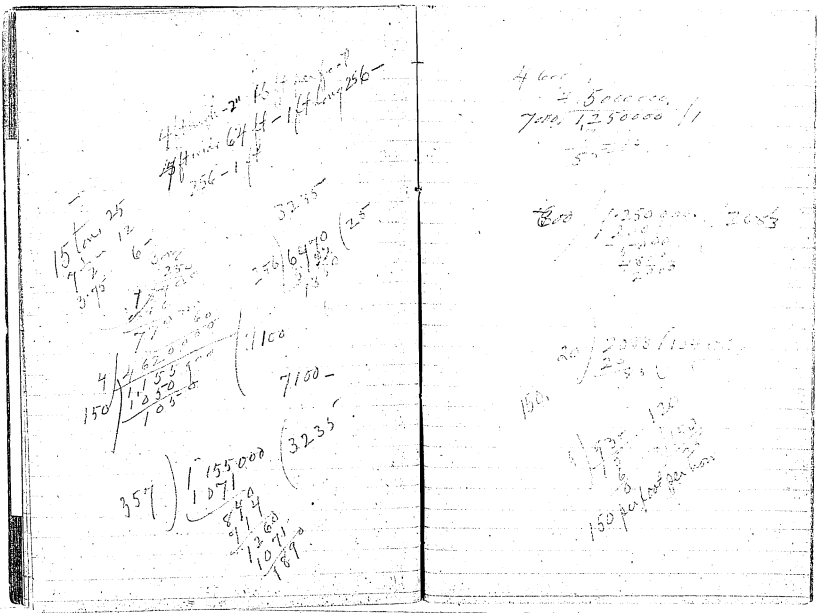
40.000.000 — 30.000.000

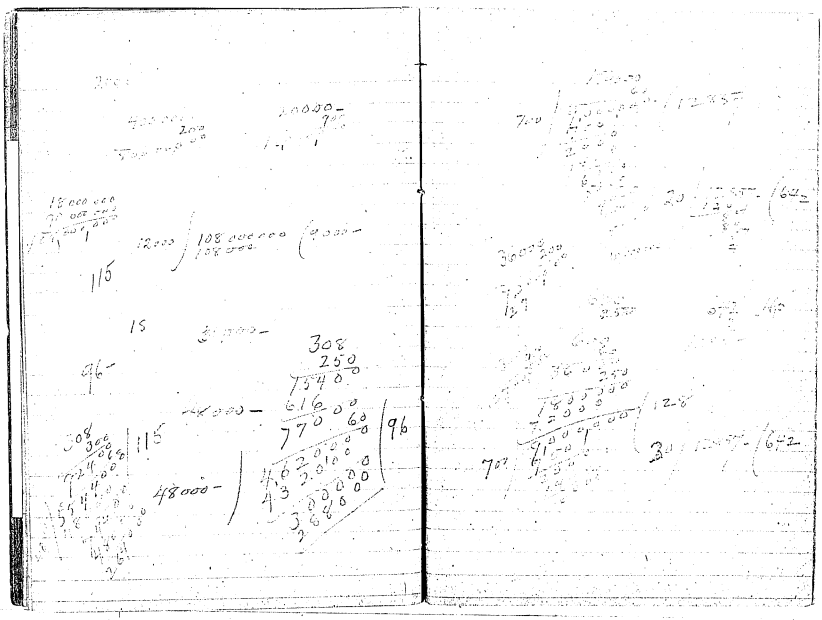
50 000.000 — 37.500.000

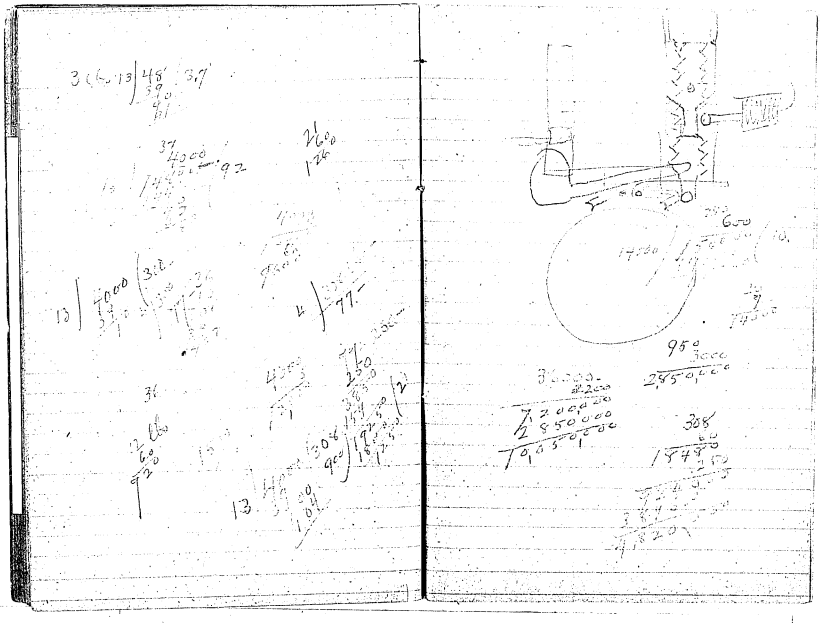
35.000.000
003

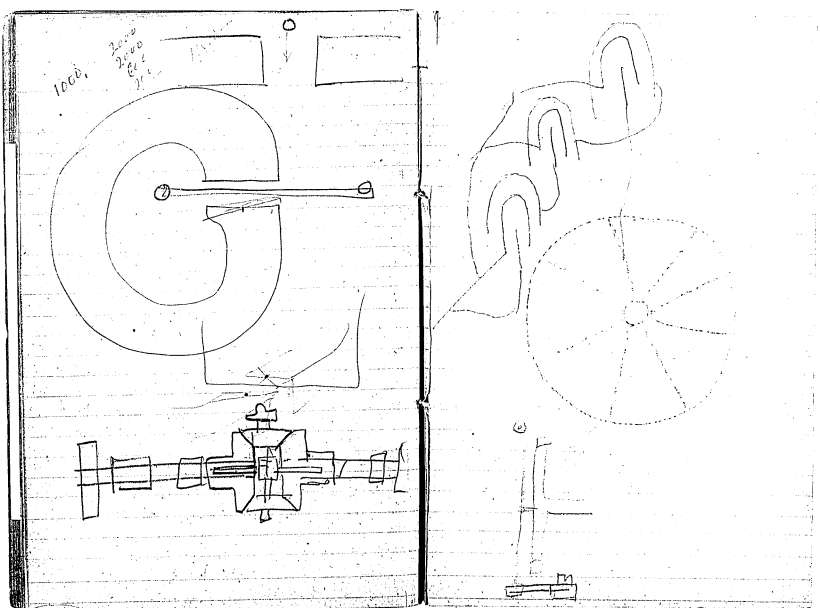
115 000. ~~50~~

40.000









Notebook, N-03-06-26

This notebook contains dated entries from June, September, and November 1903. Included are notes and drawings by Edison regarding storage batteries, phonograph recording and reproduction apparatus, and etheric force experiments. Some of the entries pertain to the use of storage batteries in automobiles. There is also a list of fifteen "probable causes" for loss of capacity in the Edison battery. At the beginning of the book is a 15-page list of chemical compounds compiled by an unidentified experimenter. The pages are unnumbered, and several pages have been removed from the book. Approximately 90 pages have been used.

1333

15
2000
4 | 30000
75000 watts

1333

2000-

Vol. 1 Amorphous

Page

Aconitate of Silver
Aerolime Ammonia
Chloride of Calcium
Allantoin boiled with
Mercurious oxide
148 Aloeretic Acid

162 Ultramarine

200 Amorphous
Galolinite
Citrous Arsenious

209 Aviacardic Acid

233 Anchoate of Ammonium

240 Anchusin

241 Animonic Acid

416 Asclepias Syriaca

430 Antimonium heated with
Caustic Potash.

478 Oxybenzoide
527 Bark of the Birch
546 Benzilum
560 Nitro Benzoyl - Benzoin
576 Benzoylmid
580 Benzolite
613 Borates of Lead
672 Bromate of Silver
685 Bryonin
718 Potassium Salt
732 Camphoramide. (gummy).
836 Chlorinated derivatives of Croton (Gummy)
848 Chelidonates of Calcium
858 Acetate of Chelidonine (gummy)

amorphous gummy & yellow
867 Chenocholic Acid
925 Cholesterin
928 Cholophaein
" Cholochloïn
" Chlorochromic acid
929 Choloïdic Acid
936 Chrysanimates
949 Cinchona - red
981 Cinnamein
Nitro-mitacinnamum
997 Monobasytic citrate
997 Citrate of Aluminum
998 Citrate of Lithium
" Citrate of Magnesium
Dipotassic Citrate

1054 Cocalannic Acid
Coca - ingr.

1063 Bromin

1067 Tribromocodeine

" Chlorocodeine

1106 Ammonium - Salt

"

Page Vol III

1 Haematoxylin

5 Chlorium

18 Dichlorhamin

139 Bromhydrin

151 Heracleic Acid

167 Sulphohydrunic Acid

172 Argyrescin

175 Hirmopic Acid

177 Cupric Salt

190 Hydrocarstin
Hydrocumarinide

214 Trin hydrone oin

Ammonin

Aqueous Solution added
neutral acetate of lead

239 Gallate of Silver

274 Dracaprin

276 Nitro-Anosit

314 Spermacetic Acid

321 Silver-Salt

415 Copper-Salt

Page 433 Leofrine

437 Lithantic salt

460 Acetolactate of Iron

Actolactate of Copper

" of Zinc

461 Dibutyl sulphurous acid

462 Sulpholactate of Lead

464 Lactates of Methyl

475 Lead salt

788 Isomalic

791 Malates of Ammonium

793 Malates of Copper

Malate of Iron

Malate of Lead

800 Mandelic Acid

816 Sulphide of Manganese

821 Mangostin

825 Manitic acid

Manitates of Copper salts.

852 Margarites

Barium salt.

854 Marmodin

912 Amorphous Mucic Sulphide

984 Mutulmic acid

993 Zodide

1004 Calcium salt

1008 Dicyanmethylene

1014 Cerous sulphomolybdate

1054 Cyanurate of Morphine

" Hyppurate

1055 Militate
1056 Lodomorphine
Hydriodate
1072 Hydriodate of Lead
1075 Lot Nitric acid

Page 4 Vol. II
Alcoholic tincture iodine mixt. Conine
Conine exposed to vapour of bromine
" 5 Acetate of conine
" 14 Convolvulic acid boiled excess of Baryta-water
" 14 Calcium-Salt boiled mixt. milk of lime
" 18 Copaiba-resins
" 18 Glycopaivic Acid
" 19 Copal

Page 70 cupric oxide in ammonia
" 102 Creatine & Creatinine by action of Nitric Acid

Page 108 - Barium - Salt & Lead Salt
" 109 - Crocetin
" 111 - Crocopanthin
" 114 - Crystallisation - Plastic sulphur, nitrous arsenious acid & Barley sugar.
" 177 - Cinco - sulphophenamide
" 183 - Cummylide of potassium
" 185 - Cubcarine
" 200 - Ammonia Cobalticyanide of Nickel
" 208 - ~~Cupro-cyanide of copper~~ cupric salt & cyanide of potassium
" 209 - Cyanide of Ammonium + cupric salt
" 228 - Ferric ferrocyanide
" 247 - Pulverised crystals heated mixt strong sulphuric acid.

Page 274 - Cyanin

" 294 - Cyclamin

" 322 - Diffluan

" 330 - Digitassolin

" 336 - Digonyl

345 - Dragon's Blood

351 - Bamin-salt

360 - Dysbysin

483 - Alcoholic solution of Eburnicasin

502 - Eythrasin

533 - Hydride of Ethyl

543 - Silicohydrate of Ethyl in contact salicylic acid

548 - Sulphi ethylate of Copper
Sulphiethylate of gold

557 - Chlorhydrate or Hydrochlorate of Ethylamine

570 - Bromethylene or Bromide of Ethyl

581 - Ethylene, oxysulphydrate of

602 - Euchlorate of Silver

604 - Eugenates

609 - Eupanitate of Silver

610 - Salts of bromeupanitic
Chloreupanitic acid
Nitroeupanitic acid

646 - Ficus sylvatica

646 - Felicic acid
Sodium salts
Chlorofilicic

646 - Filimulin - sulphuric acid

646 Filipicic acid
646 chlorofilipicic acid.

Page 693 - Aromatics of Tin
Stannous formate.

693 - Stannic formate

739 - Scopin

746 - Sulfanilamide

749 - Phosphates of Sanguinine

763 - Gallotannic acid

766 - Bromine on gallotannate of Bismuth

766 - Aqueous gallotannic acid with aqueous acetic -

767 - Tannate of Antimony

768 - Tannate of Iron

771 - Garcinia Mangostana

824 - Cumulin of gaseous chlorine passed through gelatin -

830 - Glycuronic acid

831 - Lignite fuel from gentisic acid

848 - Phoglucic acid -

870 - Quinovin - sugar

874 - Gluten in hydrated state

876 - Glycuric anhydride (?)

898 - Epichlorhydrin
Cyanuric ammonia

901 - Silver - Salt. Nitrate of Silver to Alkaline ~~Sodium Salt~~ glycocholate -

Glycocholate of sodium

904 - Nitrosaccharates

919 - Glycyretin

920 - Glycyrhizin

921 - Glyapal

930. Penta-chloride of phosphorous.

931. Lucanine

932. Oxyguanine

Fol V.

Page 2 Quercitamide

" 4 Ferric Chloride - Quercitin.

" 6 Nitroquercite

" 7 Hydrated Quercitin

" 12 Quinotes

" " Quinate yttrium - salt

" " of Copper - ferric salt.

Page 17 - Quinine - Trichlorate

- 19 - Quinine salts - Borate + Chlorate

" " Croconate + Rhodizonate of Quinine

" " Hydriodate of Quinine

" 20. Cyanoplatinotes

" 21 Nitrate

" 22 Sulphate of Quinine

Page 24 - Quinotannic acid (Tannate)

" " Palerate of Quinine

" " Liquid Quinine

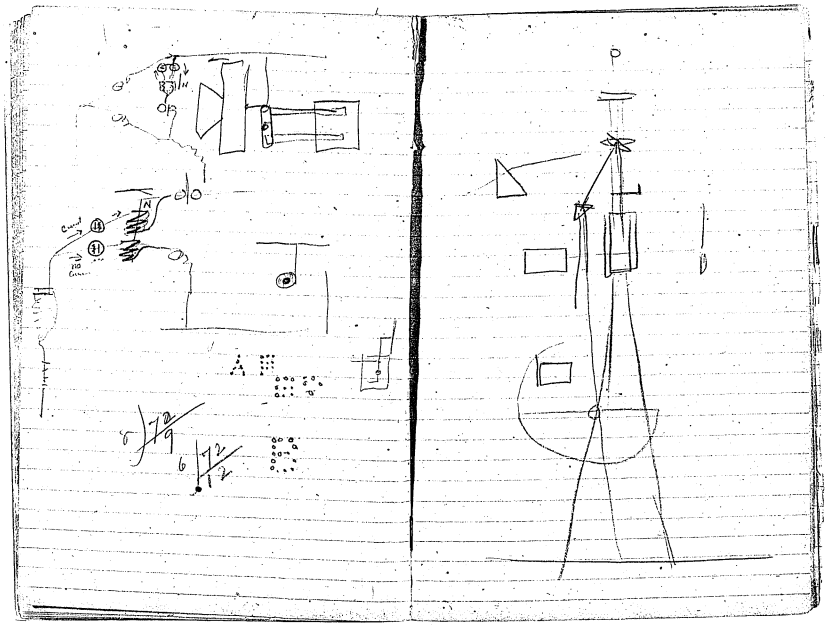
" 25 Ethylquinine

" 26 Quinine - Sulphuric acid -

" 27 Quinone - aqueous solution

" 30 Quinonic acid - aqueous solution

" 32

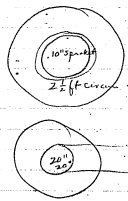


151 Rev

28" wheel 20" driven 1½ driven

Motor 2000 Rev on 151 Rev axle

12 mile hour -



12" pitch pinion

1000 ft uniform vel pinion

375
750 -

Motor ~~20~~ ~~1500~~
2000 -

0 1½ -

3
151
3
453 -

151
25
755
300
3755

1500 . 12 - 6 1000

151
25
755
300
3775

18
3
54 -
375

19

151
25
755
300
3775
3
3.72
2000
750
1500
750
0

151

150
2
75 -

625 -

12) 7.50 (625
72
30
24
60

Acetate Cadmium Gel

750
353
397 -

400.

5280
12
105 60
528 0
60) 6336 (1056
60
336
300
360
360

7 ft
28" wheel
12 mile hour
151 Revolution.

7) 1056
151

28
3
84 -) 1056 (12
84
216
168
48

1.5 ton miles per cell

1070 - 62 miles -
1070 62

1 ton 60 mile

358
2
706 - 21 - 40 cells
10

40) 60 (1.5 -
40
20

1½ ton miles per cell,

3 miles 2
6 4
12 8
24 16
48 32
96 — 64 cells
102 48 cells —

11 ft

3,6) 144 / 144 (40

Batteri, 4 28

3,6) 276 / 24 (66

36) 4.00 (120

66 lbs

400 — Carriage
353 Battery
320 — man
1073 — Total,
706 — Max battery
800 " Carriage
60 " Motor
2639

2639
5473

Axles. 2X2 10ft 120 lbs
Springs 16 ft, average
(Check ½ wide 1½ wide) 40
2 Carriage tubes 2" ¼ thick
20 ft 120
Woodsides, seat 90
bottom 120
Wheels. 166
gear wheel etc — 20
Brake 15
Seat 40
Levers 20
Chains 8
Steps etc 10
769

775 Carriage 75
150 Motor —
700
350 1 ton
1975
353
2328 — 62 Miles —

15

85 / 175 (2.058
170
500
425
750

2.058
98
16464
165222
201081

24

216 - camp

72
21
7
144 / 24
9
216
950
1080
1944
20520

1 / 12000
133 24 7 4

249.48
24.94
224.54

185
16

19
216
36
36
2268

216
105
1080
216
2268

12000
120
1080
3

2.058
105
10290
2.058
21609

133
15
665
133
2394

18 / 124 (1
18

18 / 129 (6.6
108
18

150 -
110
210
360 170

2. 48% -
97 miles

105

/25 -

7 9-

68
28
2 / 96
48

170
68
120
9
136
0
680
5081

450
18 / 8100

24
18
192
24
432

9½ =

18 / 170 (9.4
162
80
72

432
3
296
21
124
2592
2721
4

18
108
18
36
468

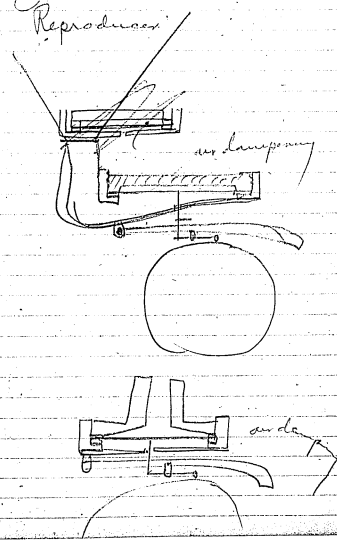
24 / 66 (2.7
48
18

36
13
108
108
36
468

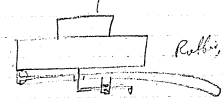
3c pocket,

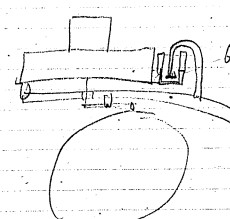
June 26 1903

Reproducer

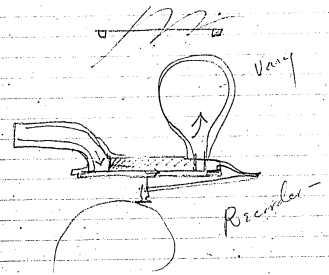


June 26 1903 —

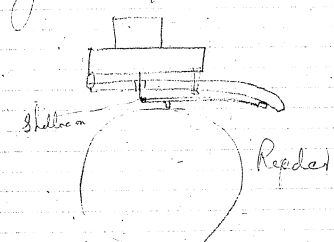




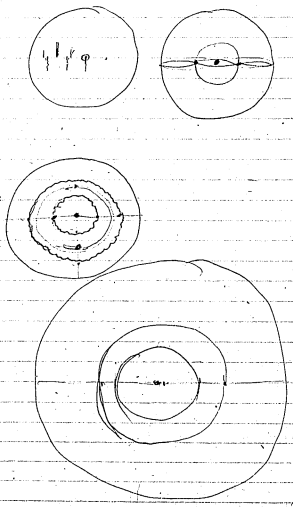
June 26 1903

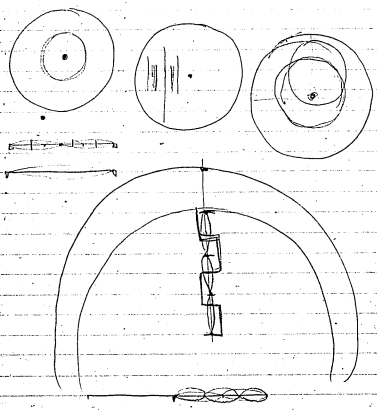


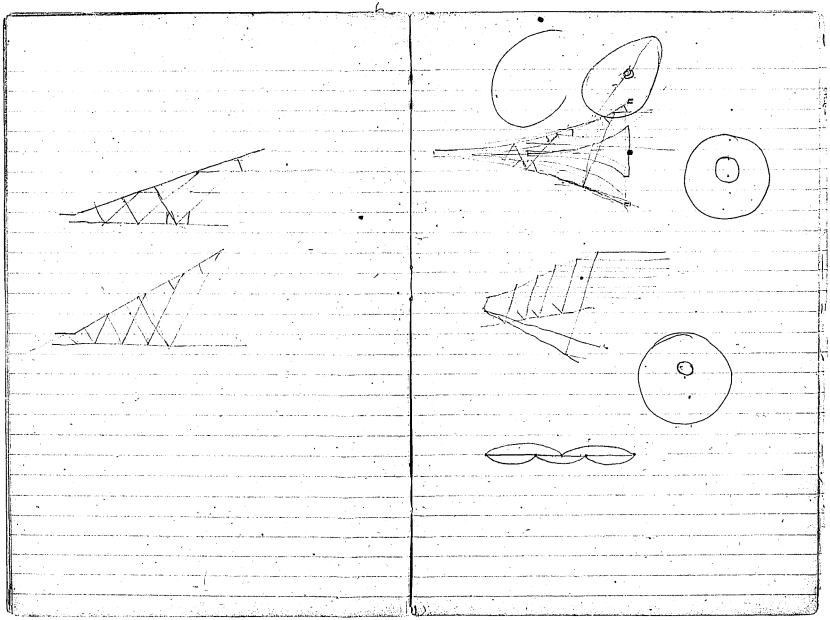
June 26 1903



Sept 12 1903

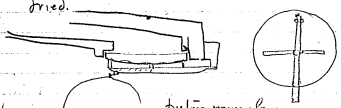






Nov 7 1903

Tried.

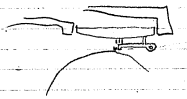


pistols principle

not fine tuned at Edges, 003 spaces

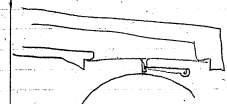
works fairly well, low notes strong high notes

moderate, Quality best

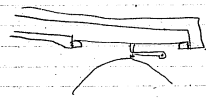


Tomorrow. Then in good shape

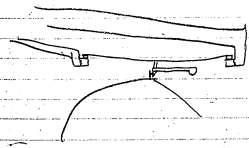
Nov 7 1903.



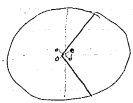
Glass disk loose at edges, edges have easier dip on dia ~~stamp~~ strained by torsion lever.



loose plate strained outward by torsion lever ordeal.

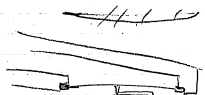


loose but rubber cemented to edges

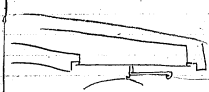


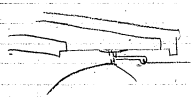
1250
1250
6250
625
3125
1250
2500
1250
2500
3750
1250
3906.25
1562.5

Nov 7 1903



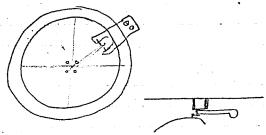
Rubber on both sides of edges - forced in acceptable
so as to put skin under tension.





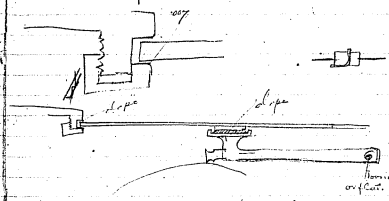
powerful tension

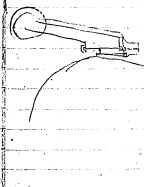
Nov 7 1903



Diaphragm, in four sections ø 0.0005 apart possibly 8 sections better. There would be only one fundamental and no overtones by [redacted] placing of pins coincident. Recorder latest could break this up from a fundamental to overtones of lower compatibility.

Nov 20 1903

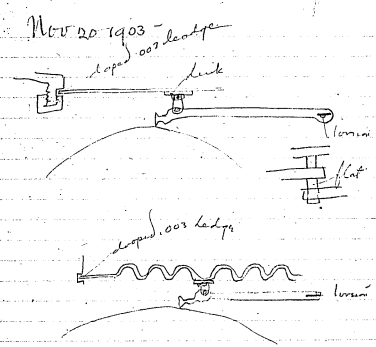




5/8 dia Mica .0015 to .002
Tonnin levers. also dropped wed.
Try shellacked tissue paper dia —
edge on 003 bridge dopped heavy
dope.

Try 1/16 felt dia - doped small bridge —
Tonnin ~~dia~~ lever

Nov 20 1903 –



Try putting X Ray & Radium fluorescers under pressure gradually moving between thick glass plates,

Try Radium on Chalk telephone when working acc of charges Capillarity or rotation,

Nov 20 1903

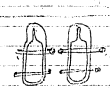
Size of Radium changes hysteresis in Metal rod –

See if rod gives off a ray at the moment when it Cools down from high heat & gives that jerk – also try it in Coil & try Current heating wire as source & detect by fluorescent sulphide & try Oxides – These should be a powerful change also try wire with X Y Z receivers –

Make a slide with all the Metals & Metal Oxides &c

ditto with all the Oxides
" " Hydroxides

Make a slide with 50 vials for liquids in lime glass



Nov 20 1903.

Some of probable causes of Nickel Electrode in SB. losing its capacity for full discharge by several hundred reversals -

1st Sulphur forming Sulfide or blinding grid
2nd Gelatinous Silica
3 " " Aluminum -
4 Iron deposited inside and acts as reducing agent, Calyhzer,
5 Mercury depositing inside -
6 Tin depositing inside,
7 Impurities in Iron depositing inside -
8 Nickel reduced to metal Hydride
9 " " to an oxide dehydrated
10 " " to Metal
11 Hydrogen passing down pores of graphite getting nickel hydrox out contact
12 Iron or impurities depositing on grid or graphite then oxidizing get Ni OH out contact
13 Highly conc KOH forced in a heat burns Ni OH to white insol Ni OH, same as when its heated in KOH,
14 Hg gets in and forms Na Amalg & reduces Ni OH to Metal gritty,

15
16 Hydrogen giving swells grid too much

"

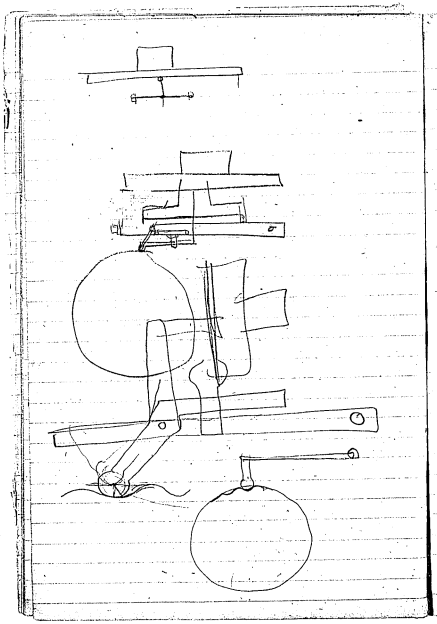
Nov 20 1903

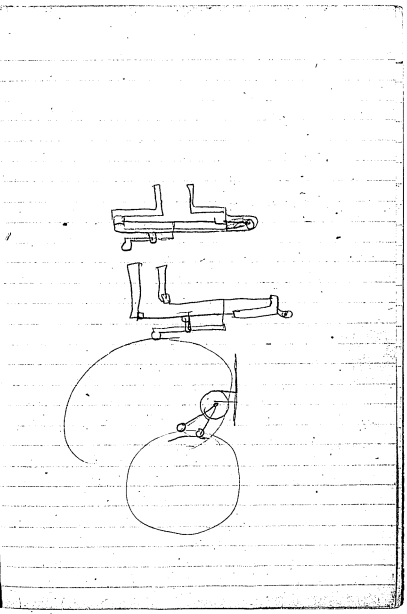
Try Radium on a small cell see how it effects. Em T -

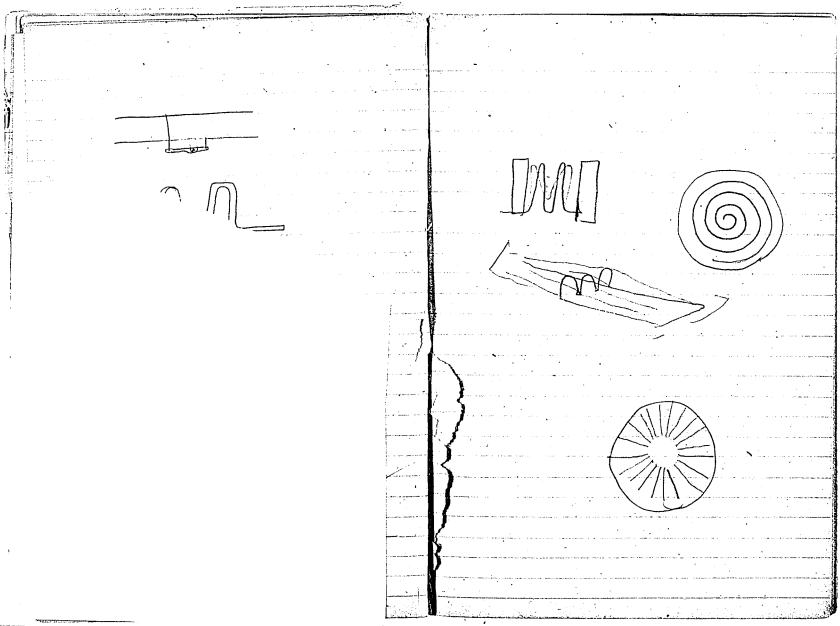
Dissolve all varities of asphaltic in Carbon Disulphide with various proportions of Sulphur that Evaporate CS_2 & Vulcanize to obtain a substance hard hard rubber suitable for operations on S Battery

Possibly some of above will melt & act as hardeners for phono Records

In place of Carnauba Shunk Shellac & some of the metal will do to harden made by fusion process fm Acetate, for Records Etc.





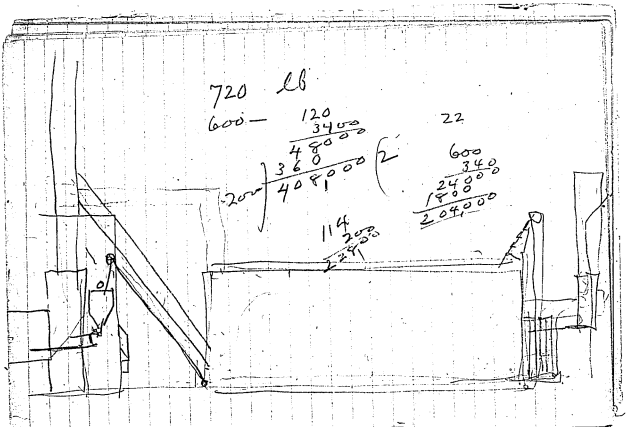


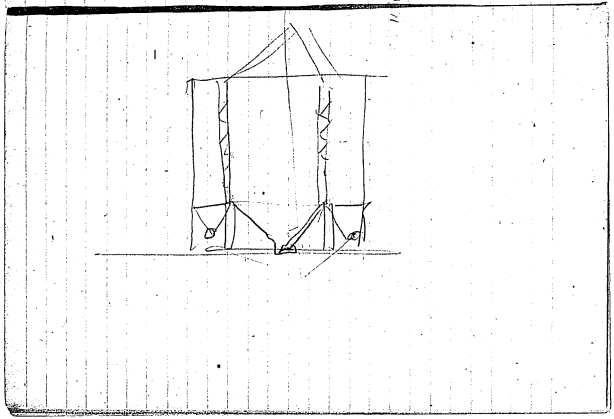
720 lb

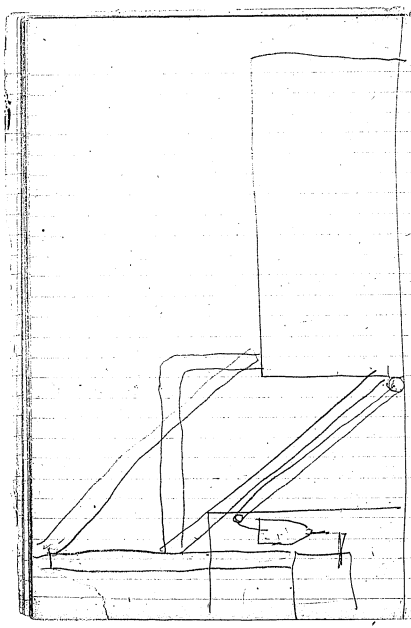
600 — 120
3400
480000
360
408000
200

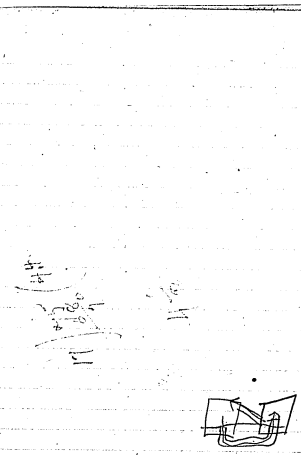
22
600
340
240000
180000
204000

114
2400
2400









600 — 86

300

5 — 16

161

24

225

600

3500

4 | 300

25

60

161

180

125

700

600

300

2500

15

30

28

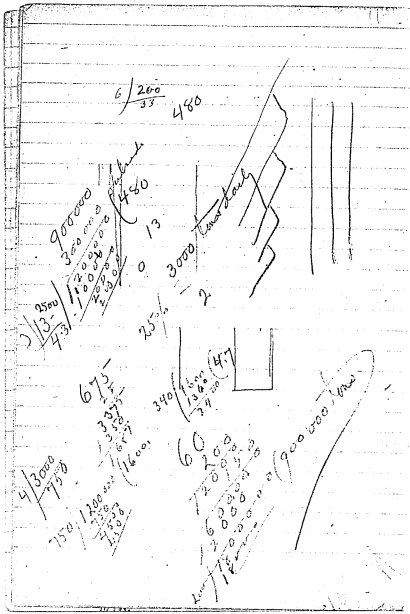
60

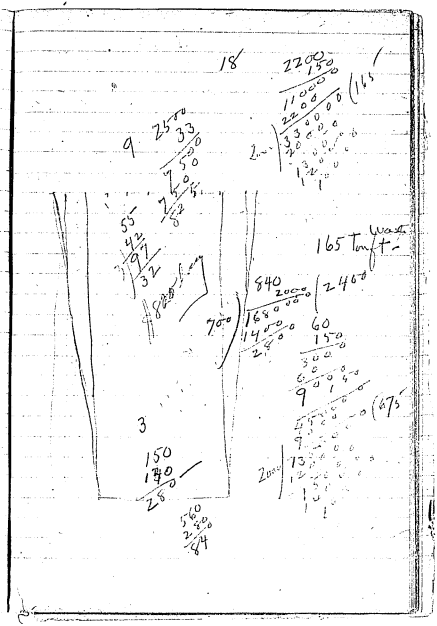
720

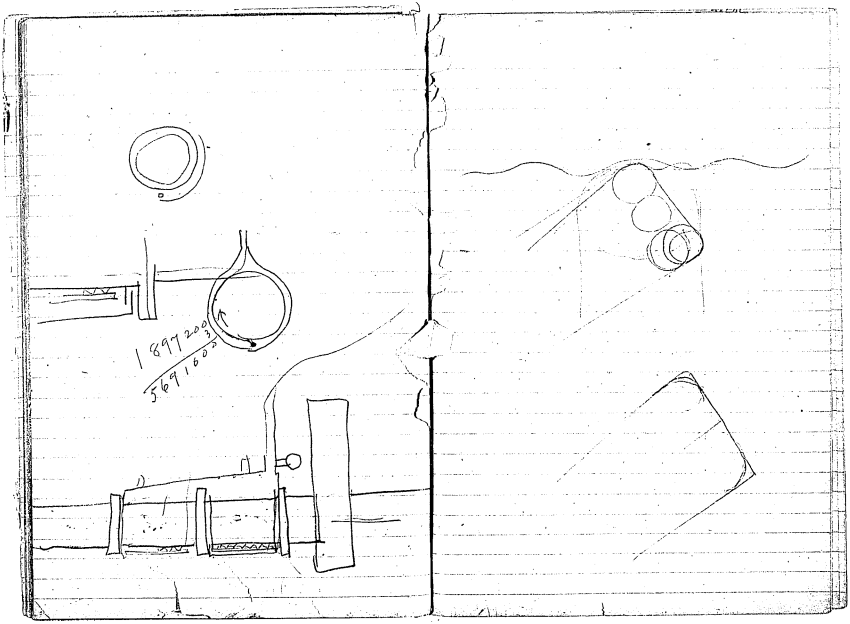
17

17

28




165 Tons


1897200
5691002

124410

150

148 70

2400000

12441

27

54

216

108

1296

12410

3.5

1800000

124 410

90 514

2 147 624

1074 628

429 884 100

90 514

5373 1

27

54

108

54

648

1296

28

1800

5373

1725

316800

17224

13824

1800

27

54

55

2000

90,514

35

20

1296

12

2592

1296

1800

1725

3110400

1728

1

2 to 1.

2 tons Cement 21 c 42
1 ton Lime 120 — 120 / 42 / 33 / 78 / 33 / 45 / 33 / 12 (3.3 — 16

16 C 68P-

18

3 Cent 21 63
1 Lime 120 — 120 / 63 / 4 / 57 / 33 / 60 / 33 / 27 (1.4

14 C

4C

3 Cement — 42 c
1 Lime — 1 Ram 42 / 31 / 33 / 73 / 33 / 40 / 33 / 7 (7.4

7.4

1.4

3 Cent. Cent 63
Rambrani — 31 / 4 / 27 / 33 / 90 / 33 / 57 (7.3

7.3

1.3

3 Cement 63
1 Ramb — 50
4 / 13 / 33 / 26 / 7 (8.5

8.5

2.5

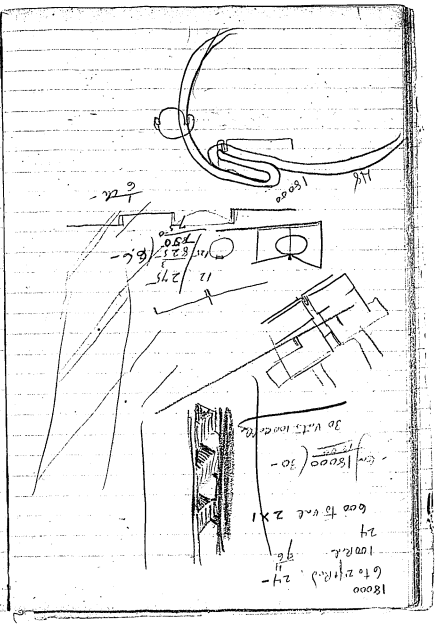
2 Cement # 42
1 Ram — 50 / 3 / 9 / 33 / 310 / 297 / 13 (9.4

9.4

3.4 all rams

2 Cement # 42
1 Lime 33 / 33 / 9

6 C



3000
85000
6000
28
28
2000
71
85000
84
6
6
2000
.333
4800
776
2000
35000
84992

12 Hills 250 ft high 4.44 HP gravity

20220 watt hours

60 watts per 1000 lb mile —
3600 lb — 210 watt hour per car
gravity 3410 watt hours —
level 16810 watt hours
or 80 miles without change
Sand roads 50 miles 50 miles —
or long hg 110 + 80 miles —

180
125
700
360
180
2250
112
354

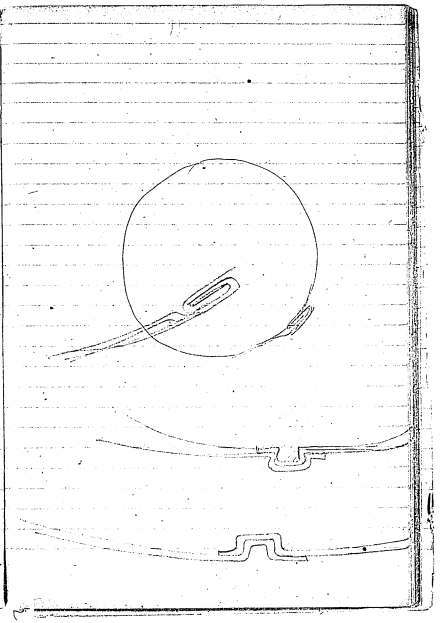
54
27
81
324
108
324

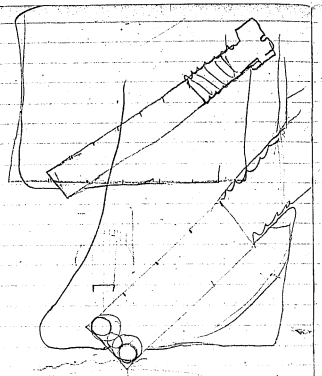
4410
4444
3069
3069
3069
3069
3401

20220 | 210 | 16810 - 180
3410 | | 1680
16810 | | 10

Saratoga, Schenectady
Utica Richfield Springs
Scranton, —— Delwater gap
Easton, Washington,
Hackettown, Morristown
Orange, Newark N.J.

N.Y. Jefferson, Poughkeepsie
Albany, Pittsfield, Hartford
Worcester Boston, Concord
Utica, —— Hartford
~~Bom~~ —— N.York





116
29
145

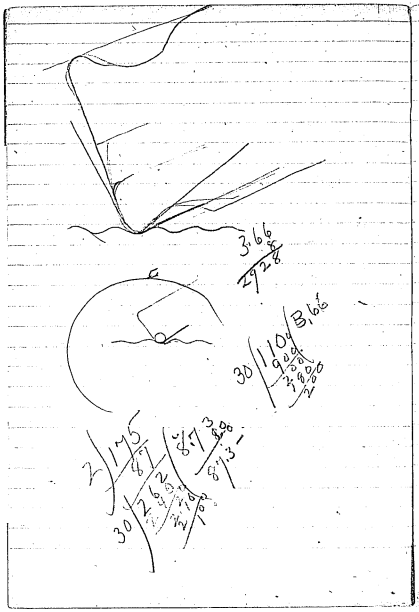
NY Newark-Elizabeth, Rahway
New Brunswick — Lakewood

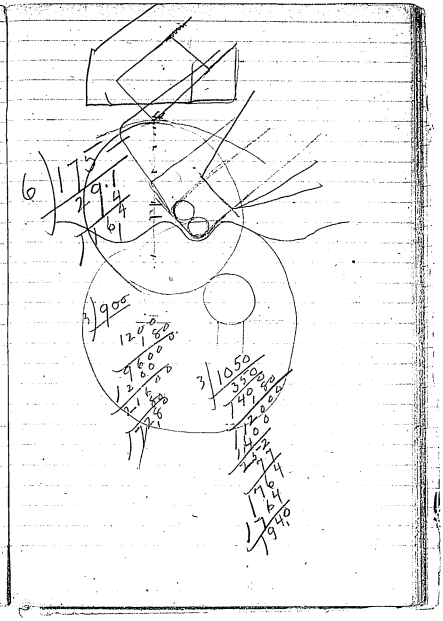
NY newark Montclair, Suffern
Port Jervis, Del water gap
Manuchunk Washington
Hackettstown Morristown,
Orange NY York —

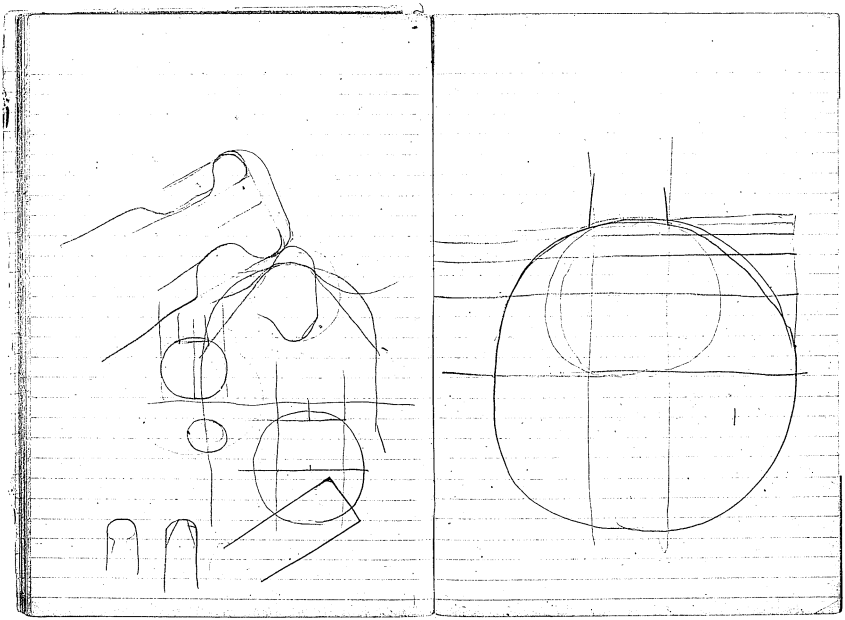
NY, Newark New Brunswick
Long Branch Asbury park
Point Pleasant, Lakewood, Moorestown
Phila

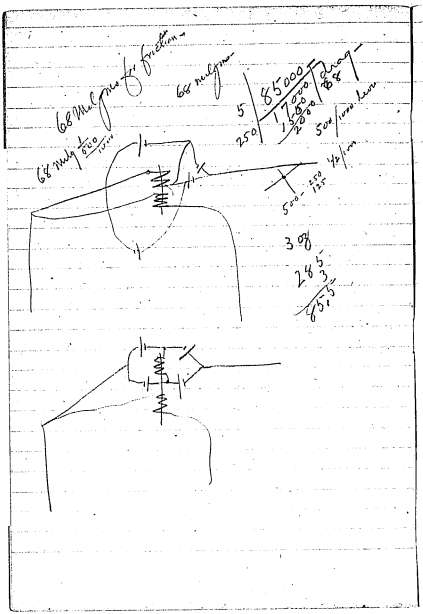
Phila Atlantic City
Lakewood Moorestown
New Brunswick NY

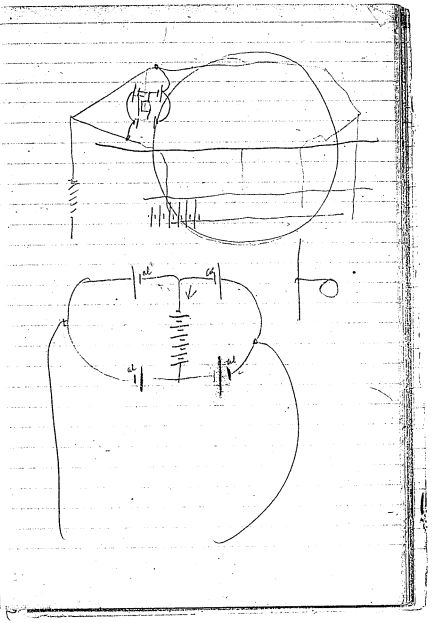
NY York. Suffern Newburgh
Poughkeepsie — Albany
Albany - Saratoga
Sar

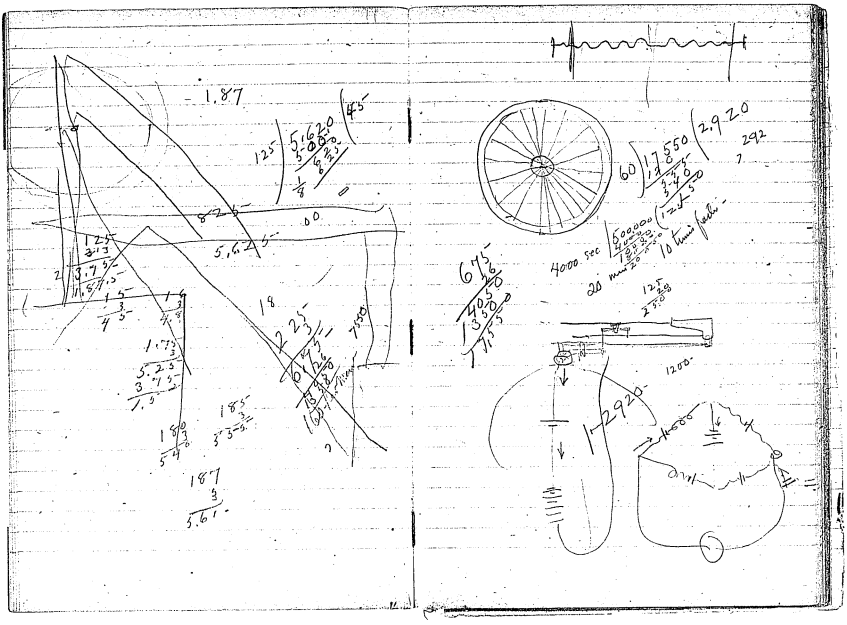


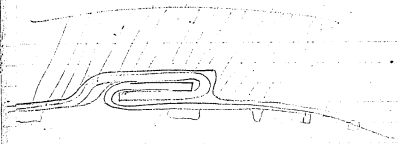





68 mulgrew
68 mulgrew
68 mulgrew
5 | 85000
250
500 - 250 = 250
500 - 250 = 250
38
285
651




1.87
4000 sec
20 min
10 hours
1200



147 | 68250 | 464

249

170000
136000

334250
273000
67250

65250 | 464

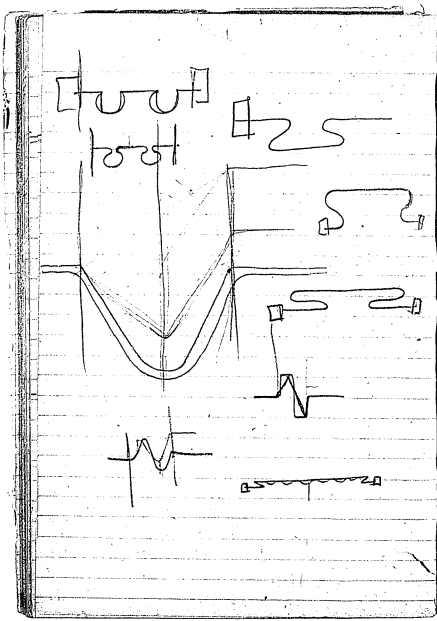
56000
56000
5000
5000

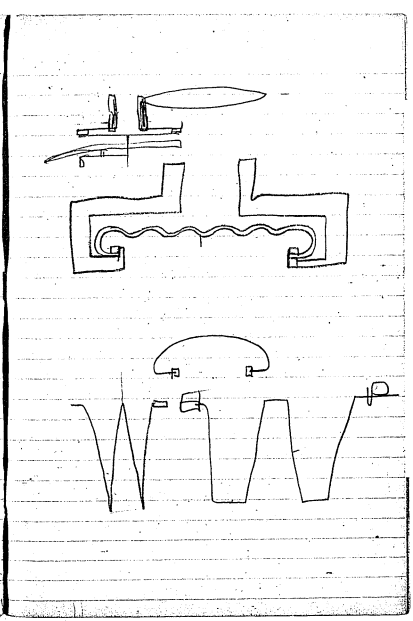
826550
249
744120
20

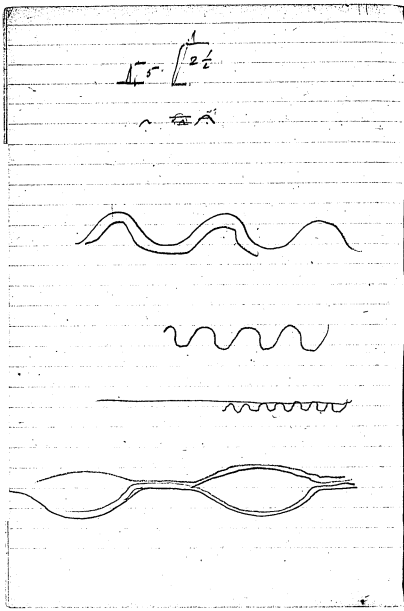
175 | 82550 | 472

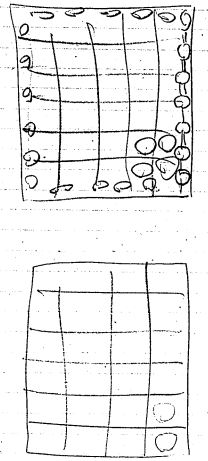
135 | 63000

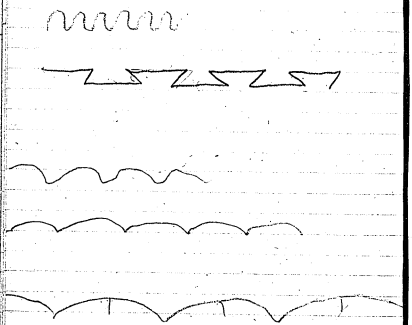
1320 | 408











250
250
250 0
00
625 00
6200 1
499

249
249
2241
996
498
6200 1

500

62500 | 500 0000 | 8
37500

62500 | 500 000 | .71
437500
625000

8 hour chg 8 hour dischg

290 — .0055 3½ lb-cell

9 cells Cold run grams coefficient — Cut out pap. Plus 20 —

3 " No work air dried

3 " " Dried low heat.

9 cells Cut Kg Irons

9 " " Restored one week

del Reform - N_2OH_2 - made chg wamp

Dif wamp loading

5 Rings - spaced right -

Thro 20 30 40 50 - from — -

Mix Ni Co of Cake by action

8 Co 1 Ni

7 Co 2 " 3 liters Sol —

6 Co 3 "

5 Co 4 " use ½ thick Ni of pocket,

4 Co 5 " Just use reg thick Ni -

Punched perfo. group -

Nickel plated tubes from .005 of mm to .006 or ½ mm Ni —

Warm twisted one turn (tubes) pump —

group - 15% KOH 6% K_2CO_3

12 " 9% "

10 " 11% "

Just strength punched + burn stock

log. ifl 5 grams per cell

Thin walled low pressure Opening —

Also 4 Tubes with Reg Reg Cut Reg wam

with 5 6 6.5 7 7.5 grams per pocket.

dutch 80 to 20 Bi no-Kg - 6.5 - 7 grams

435) 7460 (17.1
435
3115
3045
65

3) 1100 (366
1866
1755
1100
1098
2
1099
1098
1
8996
1099
1991
1991

246) 746 (3
738
8

17) 145 (8.5
136
9

197
125
785
394
197
246) 25

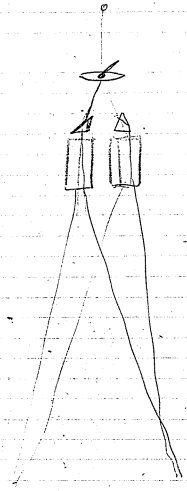
328) 746 (2.27
656
9.56
6.56
2.44

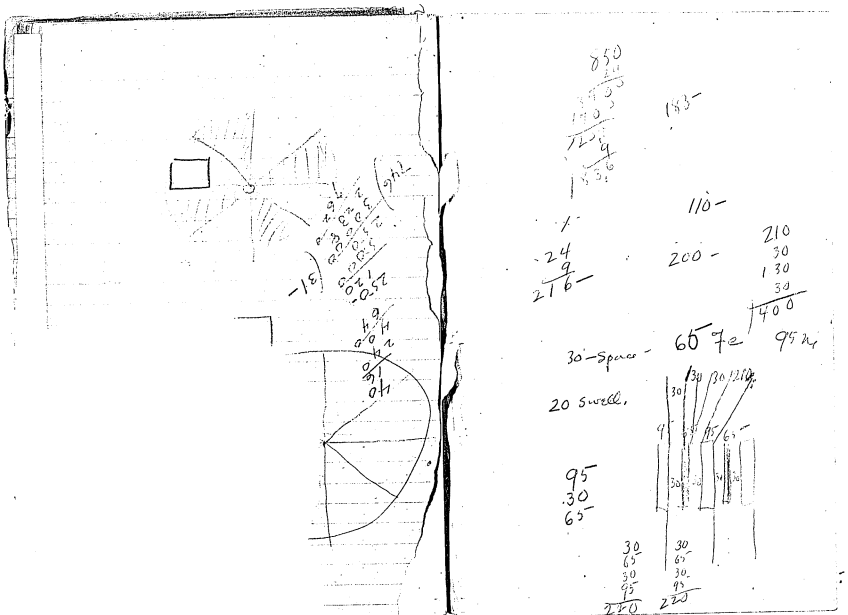
33) 746 (22.6
66
80
66
20

22.6

227
145
135
908
227
3.2915
3966
180
25

1176
1466
3.88
263
125
131
126
38
2.86
3.257




850
183
110
24
9
216
200
210
30
130
30
400
30-Space
65 7e
95 4
20 Swell.
95
30
65
30
65
30
95
220
30
65
30
95
220

Notebook, N-04-05-10

This non-standard-size notebook covers the period July 1903-November 1904. The first 59 pages contain notes by unidentified experimenters regarding storage battery endurance tests, along with a few log entries for shipments of electrolyte solution and cells. Beginning on page 67 is a series of notes by Edison on endurance tests. Six loose pages of notes regarding the battery experiments have been inserted into the book, the first two of which contain instructions by Edison. The book contains 253 numbered pages. Approximately 60 pages have been used. Many pages are blank; pages 65-66 have been removed from the book.

Only the material by Edison has been selected.

Group to see at what rate the loss of ampere capacity goes on –

Group No 1 – Three new cells from factory that have never been charged but have been washed in the regular way Numbered 5175 – 5154 4788.
Cells filled with 750 cc 33% and balance with 21% KOH. Ni mix 388 Fe mix. 603.

5175 has 388 Ni + 603 Iron
5154 " "
4788 has 326 Ni + 597 Iron + Old gauze Top.
4812 " " New Top

Group to ascertain of chlorine medium will prevent loss of capacity —

Group No 2 - Three new cells never been charged but washed in regular way No 4655 4510 4770 750 cc 33% KOH to which is added + dissolved six grams of potassium chloride balance cell filled with 21% - to one cell. add 6 grams KCl No 4655 - to another cell No. 4510. add 18 grammes of KCl to the 33% and to the third cell No 4770. add 36 grammes KCl to the 33% KOH.

M mix 388 F mix 603

Group to prove if washing iron in addition to Ni flow is beneficial — originally

Group 3. No 5223 5177 5159.
Ni mix No 388 Fe mix No 608. all new plates, the nickel plates are each to be put in a receptacle between iron sheets and given a reverse charge of 50 amperes for 3 minutes in cold KOH 20% — being permitted to soak for 15 seconds before current is put on. (then put on charge) The iron plates are to be assembled into a group and charged against a can [not reverse] the can being kept to 150 Fahr. charge is to be for 15 hours at 60 amperes. Then put the iron group in new can with fresh KOH, cold and reverse to discharge the iron at 40 amp rate until it is reversed and the iron can be removed without self heating. Then assemble the cells in the regular way without the washing process, seal and add KOH to give the right per cent. The nickel plates as they come off the 50 amp 3 minute charge are to be kept in distilled water until ready to assemble,

Group. to see if it is necessary to wash the non Electrolytically and to see if regular washing will answer.

Group 4 –

Nos 5162. 5134 5141 – Mix No 388.

72 mix No ____

Reverse each nickel plate 50 amp in cold KOH 21% for 3 minutes each plate as done put in distilled water Each plate soaked 15 seconds before the 50 amp reverse charge. – These plates are to go to Cleaner and assembled with non plates in Regular way, welded and washed in regular way and KOH put in reg to get right % KOH.

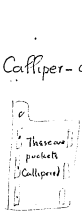
Charged 6 hours at 48 amp by mistake

Plate 7 Dry

0	15 Edge	25	27
	91	98	102
	101	111	111
	87	95	97
	91	102	99
	84	93	96
	93	103	100

Calliper – of plates (4) of Group 4

Plate 7 after Electro wash



Edge	Center	Edge
101	100	105
114	106	112
99	95	100
104	99	101
97	95	99
106	100	103

first plate had Columns wrong but figures are OK

Plate 8 Dry

Center.	Edge	Edge
92	100	103
89	101	101
89	99	99
94	108	105
108	115	110
88	100	98

Plate 8 Electro washed

Edge	Center	Edge
103	103	105
103	99	104
103	95	102
107	104	108
115	115	114
104	95	99

Plate 9 Dry

Center.	Edge	Edge
88	96	99
82	94	94
85	95	95
92	100	103
91	103	101
87	99	98

Plate 9 Electro washed

Edge	Center	Edge
101	100	103
98	94	98
98	95	98
104	101	106
108	103	105
102	98	101

Plate 10 Dry

Edge	Center	Edge
100	90	102
103	92	103
89	81	92
101	95	105
95	85	95
93	81	92

Plate 10 Electro washed

Edge	Center	Edge
104	101	105
106	103	107
93	93	95
108	108	110
99	94	98
96	94	97

Plate 11 Dry

Edge	Center	Edge
106	98	109
108	95	105
102	93	102
108	98	108
106	97	109
99	88	100

Plate 11 Electro washed

Edge	Center	Edge
108	109	113
111	104	108
107	104	107
110	107	111
110	107	110
103	100	102

Plate 12 Dry

Edge	Center	Edge
93	84	98
97	85	96
93	85	96
106	98	106
92	82	93
95	88	98

Plate 12 Electro washed

Edge	Center	Edge
97	98	102
101	95	100
99	97	98
110	110	111
96	94	97
104	101	104

Group to prove if electrolytic washing is better at high temp -

Group 5 Calls 5107 5137 5106.

Ni mix 388 Fe mix —

Each nickel plate recovered in 21% KOH kept at 150 Fahr - 50 amp for 3 minutes and plates put in distilled water, send to Glen R assembly, with non, water and wash requisiv, put in right % KOH.

Calyper. 5106 -- plate 1.

E	C	E	Dry	after 50 amp 3 min hot		
98	88	100		103	103	106
91	77	88		94	88	91
93	86	95		97	95	98
96	86	96		100	96	100
89	81	92		98	92	94
94	85	96		98	95	99

5106 Plate 2

			after 50 amp 3 min hot		
92	83	95	96	97	100
95	85	95	100	98	100
100	91	101	106	103	106
103	94	102	108	105	108
103	91	101	107	105	105
104	93	104	109	107	108

Group 5

Plate 5137 - No 4

100	85	99
100	84	97
105	90	103
107	92	106
105	93	102
103	93	106

after 50 amp hot 3 min

103	94	101
103	99	101
107	103	105
108	103	108
108	104	104
106	104	110

Plate 5107 - No 5

111	101	111
96	85	99
107	98	107
113	107	104
100	88	100
94	84	98

after 50 amp 3 min hot

115	112	115
99	95	102
112	108	112
117	113	116
104	100	107
97	94	101

Plate No 6

92	85	99
100	100	100
99	90	101
109	100	106
96	86	98
100	89	100

after 50 amp 3 min hot.

96	91	102
114	112	115
105	104	105
112	110	110
101	98	102
105	102	105

Average swell 10.66 -

Group to prove if Electrolytic washing is better if continued for longer time,

Group 6 Nos 5090 5138 5148.

Nitric 388 °/z mix 603

Reverse charge each nickel plate 50 amp for 20 minutes,

Cold Rol # 2½ - put in distilled water, take to Plank assemble with [illegible] and wash in [illegible] put Rol Reg m. -

Jar got 10° hotter than atmos temp -

Caliper - 5138 - plate 22

Dry			After 50 amp 20 minutes		
100	88	100	103	101	103
105	90	102	108	106	107
102	92	103	109	109	109
95	88	98	101	102	103
103	90	103	108	107	108
98	93	104	107	113	111

plate 21 5138

Dry			After 50 amp 20 min		
102	85	100	105	99	102
97	81	95	100	94	98
103	87	101	107	100	103
97	84	97	101	97	99
94	80	95	98	95	98
99	89	101	98	101	104

Group 6

5148 – Plate 23

Dry			After 50 amp 20 min		
a	c	e	a	c	e
100	85	100	104	101	103
101	86	99	108	105	104
104	91	100	110	108	107
103	88	103	108	107	106
99	85	99	106	106	104
101	92	105	106	108	110

5148 – Plate 24

Dry			After 50 amp 20 min		
a	c	e	a	c	e
88	74	88	112	108	115
94	79	94	95	89	94
95	83	95	97	92	96
95	83	96	99	96	98
99	85	100	103	100	104
97	88	99	101	101	102

No 5090 Plate 19

Dry			After 50 amp 20 min		
a	c	e	a	c	e
98	82	98	103	99	102
92	78	91	95	93	95
99	87	99	103	99	102
99	87	101	105	101	102
95	83	96	99	96	99
97	89	100	101	101	105

Average swell 16·22–

5090 Plate 20

Dry			After 50 amp 20 min		
a	c	e	a	c	e
86	79	88	89	91	91
89	80	89	93	94	94
100	89	100	104	105	103
88	78	89	93	95	94
92	80	90	96	96	95
90	81	88	96	96	94

Group to prove if old cells can be brought back by electrolytic washing —

Group 7 Nos 5110 5122 5173

Ni mix No 219 Fe No — E45-60's 232 / 237 / 237 / 237 Peter mixed,

Enough plates from a bad E 45 cell Gibbs truck has ni plates reversed in cold KOH. 50 amp 3 minutes put in distilled water then taken to GR and assembled with fully discharged iron from same cell. wold + wash regular way + put right KOH in.

Calliper of 4 plates Group 7.

Cell 5122 - plate No 34

Dry Edge	Dry Center	Dry Edge	after 50 amp 3 min Edge	Center	Edge
108	107	107	108	107	107
106	105	104	106 -	105 -	104
103	106	107	103	104	105
110	110	112	111	111	113
106	104	105	105	104	104
109	106	107	109	109	107

Cell 5173 plate 35 -

Dry Edge	Dry Center	Dry Edge	after 50 am 3 min - Edge	Center	Edge
112	112	113	112	112	112
112	110	109	113	110	109
111	110	110	111	110	109
112	112	112	112	113	113
113	112	113	113	112	113
108	108	108	107	108	109

Group 7

Cell 5122 plate 33

Dry			After Chg 50 amp 3 min		
Edge	Center	Edge	Edge	Center	Edge
103	103	102	102	103	102
111	109	108	111	109	109
108	108	109	107	109	108
108	108	108	108	110	108
112	112	111	113	112	112
106	104	102	106	104	102

Group 7

Cell No 5173 plate 36-

Dry			After 50 amp 3 min		
Edge	Center	Edge	Edge	Center	Edge
108	111	110	120	112	110
105	104	104	105	104	104
107	104	106	107	106	106
105	106	106	106	106	107
107	107	109	108	107	110
108	108	109	108	110	110

Group 7-

Cell 5110 plate 31-

Dry			After 50 amp 3 min		
Edge	Center	Edge	Edge	Center	Edge
105	107	108	107	108	108
110	107	107	109	109	107
111	111	111	110	111	111
108	107	107	108	108	107
108	107	110	108	107	109
110	111	110	107	107	107

Cell 5110 plate 32

Group 7=

Dry			After 50 amp 3 min		
Edge	Center	Edge	Edge	Center	Edge
103	103	103	110	111	110
108	108	108	103	103	103
106	105	105	108	109	108
106	106	104	105	105	106
103	105	106	105	107	107
108	107	108	110	107	108

After 56 ch taken out & finished 24 hrs ch on board.

56th Run.	5122 —	120 —	124
	5173 —	128½ —	124
	5110 —	127½ —	128

After 56 runs reversed Ni against can, 15 hrs at 60 Amp at 150° F. Then changed KOH & charged 24 hrs at 40

57 Run. Cell	5122 —	150	158½
"	5173 —	157½	158½
"	5110 —	158½	157½

Charged 12 hrs @ 50 & put back on insurance

After Run 62 stood after ch for 6 days while balance of cells being tested

" " 63 They fell below a volt at 120 amp.

After Run # 69 they were cut out of the test & the following treatment given to them.

Charge 24 hrs at 40 & run @ 30 amp.

Run 70 =

Then if bad reverse the Ni. alone against the can at 60 Amp for 24 hrs & note temp.

Then charge 24 hrs @ 40 amp

Run 71 =

Group to see if rejuvination of Ni cell is improved by electrolytic wash in hot KOH as against cold KOH —

Group 8 No 5125 5092 5170

Ni mix 7 Fe Mix — Bad E 45 Gibbs No: 1257 1291 1322 1362 Plates removed.

Reverse each Nickel plate in hot (150 fahr) 21% KOH.

50 amperes for 3 minutes and put in distilled water, assemble with Iron plates from same cell.

wash regular + put right KOH in

All the Callipers are the same after reverse as original only a few variations now and then, both ways —

In this experiment the radicals are deposited on the cathode of the cell into the new Kott—

Experiment to see if can not charge) water by difference in comp and to group 10

Group 9
No #5075 *5102 2392 #4098 E45-(272 Ka. 5070 Ka.)
0.28 56

Plates from E45 Gibbs cell Truck poor cell, from E45 No 2 Reverse not to can not get to can by using asbestos, leave it in the original can and change Kott, + While reversing keep temp 150 Fahr,

* Cell #5075 + 2392 were short circuited + were replaced by Cell #5235 + 5712 made from #1511 & #5(g)(5)2 (on his 1st step)
These cells were treated as above + charged up for 24 hrs + then charged 12 hrs + put in the series with group 9 Nov 1. P.M.

Group to see if the electrolytic washing in can itself cut high temp will bring back capacity.
retain it – In this 2 put the radicals deposited on the can are eliminated by using a new can

Group 10 – Nos 5173 ~~5137~~ 5186.

Ni mix 219 Fe mix 419 E as Nos {222, 224, 225, 137} plates mixed.

Cells made up of plates from group 245 battery that has lost capacity – Reverse the nickel against the can surrounded with asbestos to get 150 Fahr. Use 60 amperes for 15 hours. Then put in new can with fresh KOH. Dont wash neg

5131 is short circuited + cut out.

To see the effect of a longer Electrolyte washing at high temp on a new cell of Nickel only —

Group 11 Nos 5135 5118 5174.

Ni mix 388 Fe mix 603

Charge reverse the nickel plates 50 amp for 20 minutes each in KOH. 21% at temp of 150 Fahr assemble with new vents + wash regulator, + put right quantity KOH in —

Cell open - 5174 Plate 16

Edge	Centre	Edge
102	88	99
104	88	102
106	93	105
98	87	99
95	83	96
97	89	98

After 50 amp 20 min heat.

106	98	102
108	105	105
110	106	109
101	97	102
100	94	99
102	100	100

Cell 5135 - plate 17

91	82 (24)	92
95	87	93
87	79	90
91	82	91
89	80	90
81	77	85

After 50 amp 20 min

95	94	97
98	98	97
90	89	92
95	91	93
93	92	95
85	90	91

Cell 5135 plate 18

97	88	97
101	90	99
105	92	103
91	80	89
99	88	99
89	83	91

after 50 amp 20 min -

101	97	100
105	102	103
108	105	106
93	90	90
102	99	102
92	90	93

Group 11-

Cell 5118-plate 13

E	C	E
104	97	109
87	78	85
87	80	91
87	77	88
91	79	90
89	81	88

after 20

E	C	E
105	105	112
89	88	89
90	90	94
90	88	91
94	92	93
93	95	93

Cell 5118-plate 14

94	84	95
89	78	86
86	78	88
82	73	78
89	76	83
83	78	85

96	97	98
92	89	89
88	85	87
84	81	77
90	85	84
85	84	88

Cell 5174 plate 15

81	76	85
80	71	79
87	78	88
92	80	93
100	89	100
87	80	89

95	88	88
82	82	83
90	92	93
97	95	95
106	105	105
93	96	95

average growth 11.26-

Group to see if its beneficial to electrolyphoid wash Fe as well as Ni –

Group 12 – No 5132 5126 5063
Ni mix 388 Fe mix 603
Reverse both the nickel and iron plates each seperately in Cal cl 21% KOH, at 50 amp 3 minutes put in distilled water, then dry & assemble put in right KOH. do not wash regular, This is the way Rogers & Madelenes old C cells were treated as far as we can learn from Fleiss & Monahan, We mean Ni Cathode & Iron on Cathode as well –

To see if long soaking of new Ni plates before electrolytic washing is beneficial

Group 13 -

Nos ____

Ni mix Fe mix.

Nickel plates soaked in 21% all night and then separately given a reverse charge in cold KOH, 21% at 50 amp for 3 minutes, put in distilled water assembled & washed; neg wrap & neg KOH put in.

Decided not to run this on account of following Experiment. Took dry plate, calipered at center

Dry	after $2\frac{1}{2}$ hours soak in KOH	after 3 min 50 amp
88	94	98
88	95	97
92	97	100
88	94	95
103	107	111
91	97	100
91.166	97.33	102

The gas swell is only 5.66 whereas without soak it averages 10.5 We think that the gas swell is the best of porosity is the right theory -

GROUP 14

Nos 5103 5139 5227

Ni mix 388 Fe mix 603

~~Group of nickel plates put in a can and charge reverse in KOH 20% cold at 100 amperes for the group for six hours, then put in new can with new irons, weld and wash regular reg KOH.~~

Assemble cell with irons + nickels put in can and connect both nickel and iron poles together + use the can for the other pole. so both Ni + Fe will be Cathodes and Can anodes. use 100 amp for 6 hours remove plates dip immediately in distilled water* and transfer to new can filled with KOH, + weld

*We change KOH, + put fresh dose of 21% KOH + run for ½ hour longer so the proportion of bad KOH in the pores will be diminished. We use 21% for fear the bad substance may not be soluable in weaker solution. then when dip into distilled water. Cells were not exposed for more than 3 minutes Except 5227 which came over with no KOH in it it did not heat.

77
50
157
77
234

GROUP 15.

Nº 5335 5304 5685

Ni mix 388 Fe mix - 603

Group of new nickels plates reversed against CP nickel sheet in a porcelain jar at *175° for 30 amp for 24 hours. assemble with regular iron group. wash the iron group regular in a seperate arm. Assemble - dont wash any more.

* Av. temp. during the reversal was 120° F.

GROUP 16.

Nos 5697 5667 5692

Ni mix 2 cells (388) 1 in (390) Fe mix #603

Group of nickels reversed against a CP nickel sheet in a ~~porcelain~~ glass jar at 175° Fahr 30 amp 48 hours. Assemble with irregular iron group wash the iron group regular in a seperate box. Assemble – don't wash any more.

This group & 17-18 & 19 were welded with special care by Ferguson & the cons were made of the best steel they could get for welding, Observe for leakes.

Group 17
Rods 5688 ✓ 5239 ✓ 5294 ✓
Nimix 388 Fe. mix 603
Group of Nickels reversed against a CP nickel sheet in a porcelain jar at 175° Fahr 30 amp 24 hours – Assemble with an iron group which has been made Cathode, with a CP nickel strip as an Anode in a porcelain jar at 175° Fahr 30 amp 24 hours – Assemble – don't wash – Be careful not to self heat assemble quickly and weld quickly – get ROH in as soon as possible –

Note Oct 31 – midnight cells ok. Nov 1 at 10 am found one iron group against the strip. Cell No _____.
10 am fixed it,

GROUP 18

No° 5620 5686 5562

Ni mix 388 Fe mix 603

Group of nickels removed against a CP nickel plate in a porcelain jar at 175 Fahr 30 amp for 24 hours, Assemble with an iron group which has been made ANODE in a porcelain jar at 175° Fahr 30 amp for 24 hours assemble dont wash, save the nickel sheet for analysis of the deposit and passivated in distilled water.

GROUP 19

Nos 5621 5678 5416

Ni 388 Fe. 603 Ni 388 Fe 603 Ni 388 Fe. 603

Regular cell, washed regular but not charged put in right KOH, & WQ to add Millon_

Cells were filled with C.P. 24% KOH that is 24% KOH which had been treated with millons base until free of chlorides etc. The sp.gr. made OK. for 21%.

25 cc. wet millon's base precipitate added to each cell during the first charge.

GROUP 20 (a)

No 5708 5140 5147

Ni mix 388 Fe mix 603

New cells with new die for crimping both nickel and iron, washed requlex and acid to laboratory for test against requlex die previously used — (see 20(b)) page 223

Group 20(b)

Cells No.s 5117 5123 5128 Ni 388 Fe 597

Ni mix No 388 (first two) Fe Mix No 603 (first two)

New cells with ~~old~~ die for crimping both Fe + Ni. Washed regular Charged 24 hrs. @ 40 + Discharged to .75 @ 30 Then charged 12 hrs @ 50 + put on endurance test.

GROUP 21

No. 373 369 375

Ni mix 7½ mix -

Rogers battery - This is a battery, having a record as below - put in new KOH. Charge 24 hours and get sure use six cells and pick out 3 good ones

	Cell 373		Cell 369		Cell 375	
	V	.75	V	.75	V	.75
Original Run.						
11/3/04	140	154½	156½	180	153	182

Group 21 (b)

Cell Nos. 5117 5123 5128

GROUP 22

No 5315 — 5657 ✓ 5552 ✓

Ni mp 388 Zn mp 603

Group of nickels rivetted against CP nickel strips in glass jar surrounded by asbestos 48 hours 1st 24 hours temp averaged 128 F. incandescent lamps put in box & covered with asbestos Temp averaged 142 Fahr for 15 hours, finally for 9 hours temp averaged 128 Fahr —

Nickel strips colored brown which rubbed off, but after that in was darkish & wouldn't rub off

Solution after settling 10 hours was very cloudy pure white, & after 24 hours is still strongly white cloudy

Make another group of old cells, which have had some long record & needs reversing
Charging only Ni against Can
Have got to find a method which
will bring cells back that have
gone bad & will charge Can
& Can be done all over the Country.

E.18

GROUP 23

No. 1269 — Ni 1141 - Fe 397 — Ni 1117

1004 — Ni 1141 Fe 401 — Fe 1141 f

440 — Ni 1141 Fe 337 — after was cut out removed.

Cells which have gone bad and need reversing. Reverse hot at 150 Fahr Asbestos Nickel to Can Iron to can, both being cathode 24 hours at 40 amperes. Change potash, change 24 hours, notwithstanding previous attempts changed discharge to 75 v. Reduce 12 hours 40 + out an Endurance

*

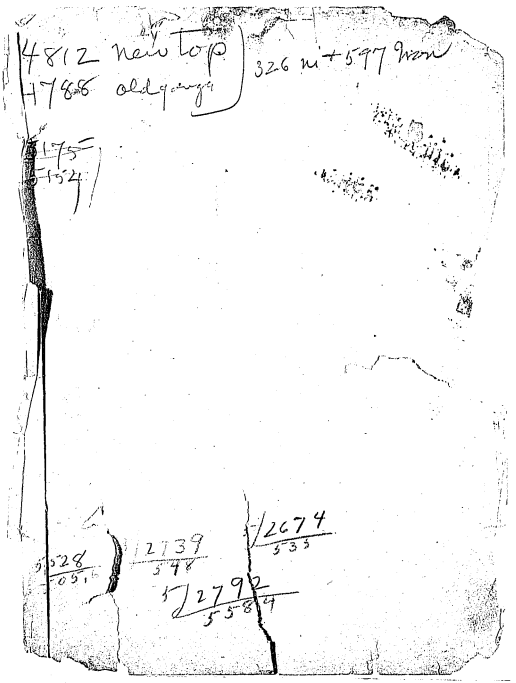
Jobs Run	# 1269 V	.75	% Loss	# 1004 V	.75	% Loss	# 440 V	.75	% Loss
original at A.R. 24 hrs at 40	140			140			130		
Run at Lab. before treatment									
Run @ Lab. after treatment									

[ITEM FOUND IN BOOK]

(7) 1 quart 60 camp 24 hours
(8) 1 " 15 " 48 hot 120 Tabs
(9) 1 " 60 " 24 hours under
Kill pounds and Water put in
4 allowed soak bed & Rooms

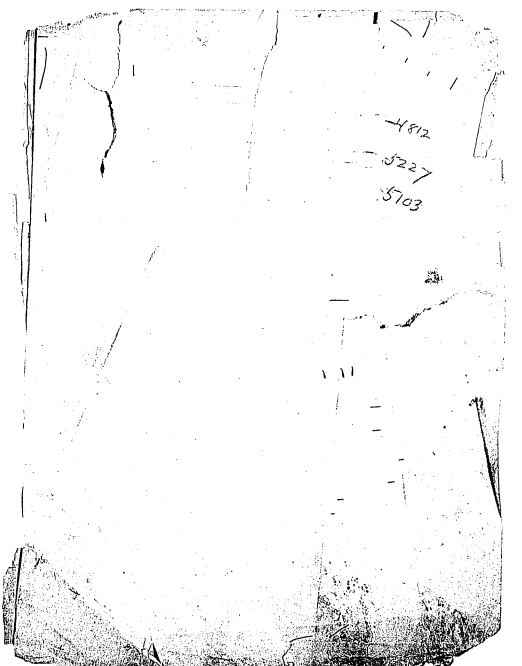
~~1 quart [illegible] 120 t~~
~~bottles 9 hrs.~~

[ITEM FOUND IN BOOK]



[ITEM FOUND IN BOOK]

[ON BACK OF PRECEDING PAGE]

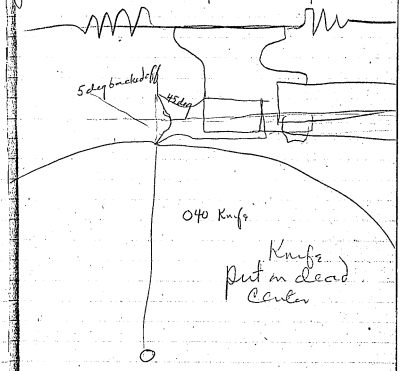


Notebook, N-03-08-24

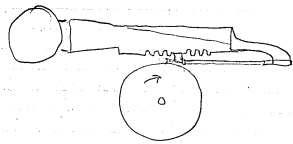
This notebook covers the period August-October 1903. All entries are by Edison. The book contains notes and drawings regarding phonograph recording apparatus and the composition of phonograph cylinders. Many of the entries pertain to tests of the arrangement, composition, and size of funnels used to concentrate sound for musical recordings. The front cover is labeled "Phonograph Aug-Sept 1903." The pages are unnumbered. Approximately 70 pages have been used.

Aug 24 1903

Phono Recorders & Cylinders chip material



Aug 24 1903 –



Plane – 6ft 9" from funnel – 75 deg Fahr –

AR jumps out scratches too much to track deeper – quickly good but not with a little explosive – no chipping surface rough –

BR Albatross as AR but cant track so deep get some scratch jumps out on some notes, surface Rough

25th E = jumps out, scratches a little, chipped in deep dado, not good at this temp –

Reg White good – Even, scarcely any scratch, only one or 2 halt jumps – Considerably deeper without increase scratch surface fairly smooth no chipping

BR jumps, scratches, chips,

Small yellow Unknown – Smooth Cut brick deep qual good, cracklies no chip

15 R
19 or 14 R Rough jumps chips

Aug 24 1903

17 R - Smooth, but cut is not polished - Seems to be uneven Cylinder too small of bigger one

13 R Phenomenon - Can't do anything with it - Can't crack it - Seems to give regards as if knife all notched up it has done this several times - S NG - Its due to not being able to turn it off smooth lots deep scratches possibly full of dirt -

40 R jumps chips - not very great scratch

34 R - a little scratch jumps out considerable on fine cutting rough - Don't chip. -

Aug 24 1903 —

49. Scarcely any scratch
Can't track quite deep — pretty
good stuff on 28 ball Even
on 35 Rag 1 R seems to blast
but not on 28 Ball 2 R —

50 R — Scratches cuts white
all chipped everywhere —

62 R Scarcely any scratch
Can't track deeper — quality
good — Even — smooth track
no chip. —

45 R Jumped out, rough surface
scratches — Can't track
any deeper

Aug 24 1903 –

44R – Its tracked deeper no jump – Scratches too much no chip quite good

36R Chipped – not very much scratch – jumped out. ~~[illegible]~~ Cuts fairly smooth,

32R = Scratches some tracked very light jumped out,

43R – Scratch very fewest fine – quitting good – jumped out on 2 notes slightly – Can track much deeper & think – Shaving tool turns it very polished – good [illegible]

Aug 24 1903

39R - Jumped - scratches, Chipped -

42R - Tracked deep very little Scratch, seems ~~[illegible]~~ not jumped -

37R = Jumped - ~~[illegible]~~ a little scratch not tracked deep - well not slow tracking deeper -

52R = Crackles terrible full holes etc - Cant test,

51R - Jumped - Chipped Scratch -

Aug 24 1903

38R = Jumped, chipped, scratch

54R Scarcely has a scratch
quite good - Thick knife
Chipped but may be a piece
dent — This is good
Cylinder etc broken
deep not chipped - not jumped,
Not extra bored -

55R Scratches some, (broken)
deep no chip no jump
harder than 54 -
Knife not chipped,

56 = Scratchy - few deep
dots chipped out -

Aug 19 1903

33R little scratchy - rough
quality - not jumped -
unnatural, —

59R all jumped out,
Scratched, chipped —

58R - ditto —

Loud - jumped badly
54R - yet not bad - scratches not
very much - This may
be ok at higher temps —

Tracked very deep very
53R little scratch - pretty good
for depth - smooth but no
Chip - Qual pretty good

Aug 19 1903

48R = Scratches very little
Crackles - quite fair -
Very rough horrible surface
about value as lamp black -
Crackles due to dust -
its probably soft material

47R - ditto still softer -

~~44~~ Piano 10 ft away

44 = Next time, moonlight weaker, music
shows up considerable scratching
Bass seems unnatural - sweet tone
on a high note. This cylinder
worn off also too much scratch ~~not~~
bracket ~~only~~ fallingupon than normal + goes down across -

Aug 24

43 - is about same as Reg white
both on 43 & Later there is 2 or 3
places where it blanks & yet no
~~blanks~~ jump out seen in there
may be due to Reproducer - I notice
swell & quality better on reproducer
has more sensitive disc also more
mellow & real as sharp - a great
amount of sharpness is accidentally
due to mechanical sharpness on
Reproducers. 1/R Reg
Corrupt'd at dur beat
I also notice that there is blanks
on a Reg after using diff kinds
Repdcers & then using original
where there was no blanks
before - This makes me think
that the Repdr starting with a
slight knock or hit on dust or wax
chip records the jump or
a very deep wobble stands it
& the jump is recorded &
keeps getting worse -
43 breaks harder & flabby sounds
than Reg white or through both
have some loudness & harsh
the quality is considerable diff in favor of Reg

Aug 24 1903 —
Piano Tenft [illegible]

Experiments with all the [illegible] and
Endeavt Reg w 43 lipo with
Hatt Chamber Temp. 127 Fahr -

44 R - blind - dont g guess - part not
blind so poor -

37 R - Scratches dont jump out
broked deep -

32 R = Scratches - dont jump out
good quality - broked fairly
deep -

34 R - jumped out little, scratches

[illegible] R — jumped out scratches

39 R — jumped - some scratch

Aug 24 1953

45 R - Jumped a little scratches
some quite good -

56 R Dont scratch much jumps
out quite poor -

40 R - Dont scratch much jumped
out badly.

58 R - Scratchy -

56 R - Very little scratch,
best after lot so far -
Not so good as 43 Cold -

Really four cracks
but quite scratch
57 R. Cracked very deep.

50 R all chipped out along
whole of the tracking -

Aug 24 1903

No scratch quality fine -

30X — but jumped out w a out
tracked deep ruff

15 R — sanatary

No scratch, tracked deep
25 X — but jumped out, swell fine -

43 + Reg white are
best — Reg the best
for all round —

Aug 24 1903

6' 9" 40/100 ball as in front book –

70 R Louder than White, overface Rough in cut, no chip – lunked family deep jumps out on reverse notes wont stand. any deeper twisting, sometimes very little better than White, squeak in high notes.

69 R Scratches more than Reg white good quad – Loud – very dirty Cracker squeak in high notes Rough cut –

66 R – Continually Chopped out ng

73 R – Better than White, best yet

Aug 24 1903

68R – Jumped out, dont scratch much, rough surface – Loud –

74R – Smooth Cut, scratches very little; not so good as 73 – Jumps out & now retake & crack deeper – 2nd time cracked very deep scratch not very much, no chip, no jump out except in a part of one single note. Can crack deeper on this than Regular, probably 73R is still better, quick from Loud – notice when cracking deeper, well not so great as more work has to be done

Aug 24 1953

106R ng- dirty- poor prospect

105 R Can track deep - bad cylinder - not bad - poor prospect.

103 R ng- dirty - " " "

98R Chips out ng -

104R Shows signs of being good - but is dirty - Can track deep
Make clean out - & very slightly -

97R Shows signs of being good
blow holes dirty - make clean
one Can track deep -

107R fair can track deep but
obstructed bad -

101R Abnormal as 104 - 104 97
107 & 101 have peculiarity that high note
not double as base is good - but on whole
not satisfactory - at right track -

Aug 24 1903

89 R Rough jumps out ng —

93 R Scratches jumps out ng

88 R Scratches " ng

92 R Scratches - Cambrioles deep Cyst/Gd

87 R all jumps out ng

91 R Scratches bad chipped

96 R shows a little signs — Scratches — slightly chip

90 — Scratches - shows some signs Cambrioles deep not bad —

80 — Cryptolgd

Aug 24 1903

Possible causes of amplification of certain notes 9 12 14 15 16 17 21 32 Etc

1st = Funnel in tune with the note.

2nd Diaphm in tone with the note

3rd Mandril between centers in tone,

4 = Recorder arm in tone between support + ball resting on wax

Aug 24 1903

5= Recorder arm in tune

6th Elasticity of way, ball on sounding + diaphram arm in tune –

7= Side arm where funnel + Recorder joined w in tune,

8= Dia knife + way + angle on knife in tune

9= Shuttlecock action between sounding board of piano + dia certain notes in tune

Aug 24 1903

10 = Hollow mandrill in tune,

11 = The Piano produces the notes stronger

12 = Window glass in tone —

13 — Tone of the Building

14 Tone or musical note recorded by turning off machines —

Aug 24 1903

15 = Trevellyn rocker vibration between
ball & knife & twist in socket —

16 = friction band in socket where recorder
goes in in tone

17 = The shaft in Centers in Connector
on arm where Reed & funnel
goes in in tone —

18 = air chamber at diaphram in
tone

19 = Arm (glass) on Recorder in tone

Aug 24 1903

20 Glass arm in tone longitudinally by elastically of shellac —

21 = Rubber ring in tone,

22, Friction bite of cylinder on mandrill in tone, this caused by given by ball

23 - Depth - or dia wax record has tone —

24 - Rubber connector has tone,

25 = 5" funnel is all right but no swells — very loud — why is this —

Aug 24 1903

26 - Belt in tune, or friction of belt in tune -

27 All our Reg Cylinders are super this Unknown recorder out adjustment - this may be something on our single recorder

28 Friction note of arm on straight edge -

29 - Knife on recorder not dead right angles to mandrill - or knife this shows on French Rec Recorder which is perfect B flat tone,

30

31 On wallers side vibration of whole recorder in Socket,

aug 24 1903

32 – As thread is a spiral. the diagram & knife must be given a circle turning when it cut a vibration, when steady cut it as head time kept when reciprocated it tends to be released – The angle should perhaps be same as thread to stop it + not right angles to mandril –

33 – Dia vibratio only on a section –

34 – Frenchman cracks frictional mechanism on tone. gives sideways movement –

35 = angled knife tends to make a note always – when dia is in accord with a lower tone multiple it gives powerful vibration – thus in conjunction with angle tendency produces the squeak – thus in so on French, as 5th B flat is powerful while tone is 15 or 3rd B flat

aug 24 1903

36 = Chatter tone is high. ~~[illegible]~~ pin lower when Conjunction spot jumps out,

37 - In French - the XIVth piece is Crown & this has a jumping note.

37 - Jump note mandolin Cantoni,

38 = Jump note, Connection between funnel & Recorder

39 - Jump note arm on attract Edge

40 Jump note big ball & wax

aug 24 1903

41 Jumpmatic Recorder in Reg army,

42 – funnels made out of tins & empty matchbox & chatter time got out then no connection. deaf in recorder is,

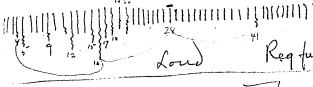
43 – French about 900 – 1000 strong than in Delhi officials 400 – 27 permanently off 50 of chiefs 240 Correspondents in formal figures long

Sept 7. 1903

$3\frac{1}{2}$/1000 paper dia. Internal deep corrugtns. 3/16 from Edge – paper pour found – Regnieu Records

Middle pieces –

No 1



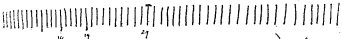
Loud

Reg found 20"

Same dia

Edge Pieces

No 2

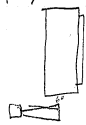


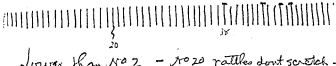
The above is 1/2 the loud of No 1

yet very much louder than many that have awful scrunches in —

No 3 Sept 7 1903

Same as 1.
Except funnel on side of
Edge of piano —



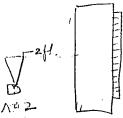


Louder than No 2 — No 20 rattles dont scratch —

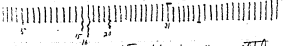
No 4

Same as No 1

This position —



This is louder than No 2
+ that is louder as No 1 —

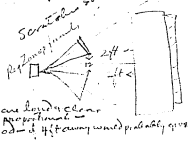


15 16 + 20 rattles

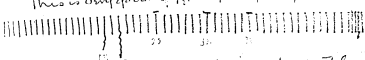
Reed same as 1

No 5 — Sept 7 1903

3.8 glass V like — channel 6½ long — 1½ groove



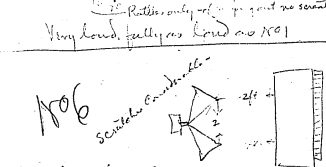
Low notes are loud & clear + all proportional — Thus is very good — if 1½ ft away would probably give good music



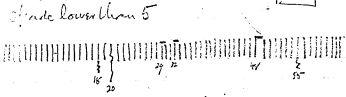
Rattles, only at 20 point no scratch.

Very loud, fully as loud as No 1

No 6



Same channel as 5



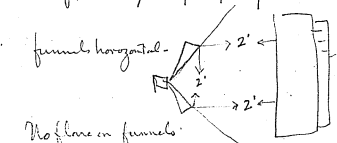
18 to 20 Rattles no scratch.

not pumped on 18 to 20 but we only — there are chatter marks in deep indentations a some chopping — These notes are clearly abnormal

Sept 7 1903

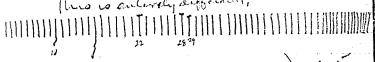
7

Two new funnels one Tin one Zinc
Tin funnel wrapped Tape —
Zinc funnel 27 long 6 opening —



No flare in funnels

Thus is entirely different,



It is only one jumped out is very deep with chatters in indentations,
10 is not jumped but 3/4 way out, only rattles on 10 & 16 no scratch, funny loud not so loud as with Reg funnels

With the Reg .0022 Aluminum disc we get the correct scratch while with 3 1/2/1000 paraffined paper no scratch but only the rattle of jumping out.

Sept 4 1903

This would imply that scratch was due to superior flexibility of all sym-it paper - & that a decid dia is preferable. as then only will the rattler be jumping out to music -

above reproduced with same funnel as I taken with the 2nd notice. 10 has not been altered - but generally there is no difference -

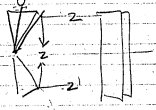
---

Two funnel flatter angle -

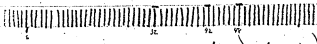
One funnel - 24 X 10½

" 22 X 10 -

8.



pop funnel 9 chanel



All ok - not very loud & tracked deep

don't show much large ones

Sept 7 1903

Duplicate wedged lighter No 9

9

all perfect,

No 10

Dup with long pad on + single keys to get await-

10

Left- 9 ran scale to very sweet + clear

The angle of funnel must change

Column of air in funnel in larger corresponds to any note in a very high one

perhaps there is an angle to a funnel where its air column is such that it will only respond to the highest notes beyond the limits of all ordinary sound-

+ the loudness obtained by two or more such funnels -

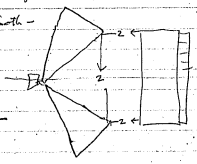
All above is fairly loud — especially had no

There is a why higher up the No 1

probably the tube from funnel to the reed to be shortened to make it higher -

Long tin funnels flat angle — Sept 7 1903

funnels 40 X 15 both —



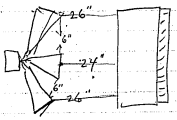
No 11 —

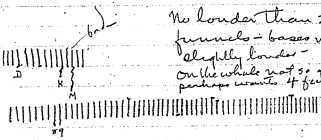
No. — 11 Rg 4

No louder than smaller funnels of No 8 = but measuring from the edge to not so favorably arranged for loudness as the smaller ones — there is a bliz further higher than No 1 ~~See~~ it would seem from this that increase in size dont do much —

Sept 7. 1903

12 = 3 funnels — Brass Tees,
Wallace No 5 funnel.





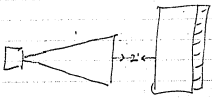
No louder than 2 funnels — bass may be slightly louder — on the whole not so good perhaps because of funnels —

Not jumped out but M. very strong
This is probably something on phono,
or tin of funnel — should be run down

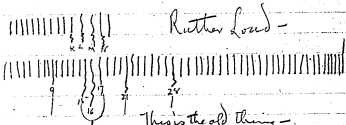
13 = Sept 7 1913

One large funnel very flat angle.

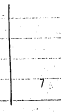
33 long 18 mouth —



Rather Loud —

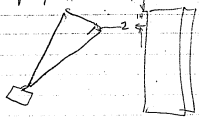


This is the old thing —
so flat angle want it. the 2 funnels or 2 options.

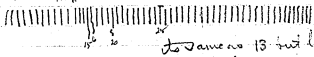


14 – Sept 7 1903

33 X 18 funnel –



Much lower volume

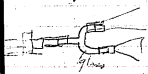


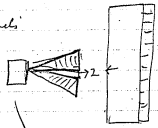
to same no 13 but lower

shows 2 funnels more bright –

15

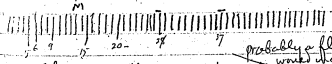
No 5 funnels 2 funnels





Loud

This is very good



probably a flame would shower sometimes or another [illegible] [illegible] cons

shows smutty in 2 funnels –

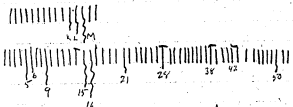
It's the loudest with least disturbance

hour hand — nothing jumped out M is strong

also, 15 had not jumped –

Sept 7 1903

16 — Same as 15 but instead of glass Y use soft red rubber ⅄ —



These jump notes are louder than with glass T hence glass T beat, the difference is very considerable —

There is evidently something about angles of the Y's much in favor of glass Y — It probably has a relation with the Z family

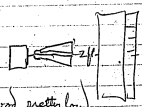
Sept 7-1903

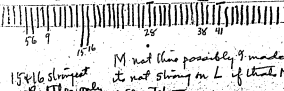
17 = We now put Cock glass ⋃ same as 15 + add some lead weight to Reminder to see if this a Recorder tone between Ball + Support – that causes M – + 15@16

Its not the weight

18 = We put on two small funnels Cut from Reg Zonophone funnels of paper The glass ⋃ used I

the funnel 6½ X 15
" " 6 X 14 –



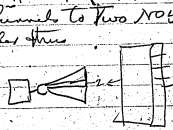


M not there possibly if made musical
15+16 strong not it not strong in L if think M –
Rattle only no sound

Sept 7 1903

18 Continued) Changing + even shaking
funnels doesn't change much except
L is weaker —
15 16 are not jumped out waves are
longer than old Equals not dumpy
but they are chipped out which is
probably cause of rattle,
also a friction ripple waves in bottom
of big waves — probably proper thing

We are making some music with
auto on 18 after practically no
swell at all horribly uneven — no jump out
We track lighter music is better, no
jump but chipper
We track still lighter music more
Even yet no jump out but close to
it but swell is very poor — wheezer rattle
/ plenty - Even with old Reppler - quite as pretty dia
no chattering
We change the funnels to two No 5 —
Im Wallen Numbers thus



Try music —

Music about same rattles, whiny + very little swell. Loud - its (wicked) higher + scarcely jumps out, We now cut funnels ~~off~~ 3 ft away —

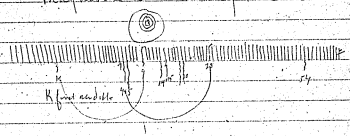
Sept 8th 1903 —

Changed the paraffined paper 3 1/2/1000 for Reg 2/1000 Cor Aluminum —
The Music is now good but very little swell + Base is poor, middle loud —
Taken with same funnels as 18 —
We now change to 2 Xylophone funnels — + try music — not so good as No 5 =

4 - 12 - 28 - 40 - 52

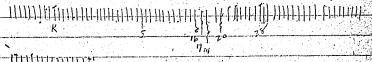
Sept 12 1903

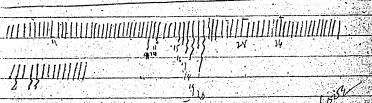
Magnesium Arc on Reg Rec 002


K first ambiguity

Evidently 3 inharmonic lines

Magnesium Rep little rung
but impaged - had crack
in center —

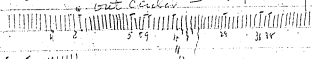




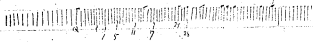
002 Magnesium
Cracked
Loaded
Lost 20 lbs

Magnesium hanger ring

out Carbon —

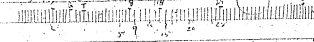


alumnum



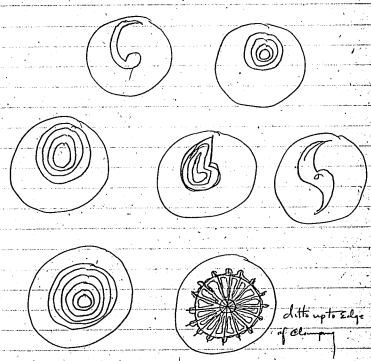
Obtaining Paper 008 dia.

Straight Cracks



paper keeps changing output until above is good on scale — none of (bad notes about) looks and (notes being simply noted or charged) Sombs, possibly Rubber that dia

Diagrams Sept 14 1903



Used paper, Magnesium, Aluminum, Lead, Tin, Celluloid

C		C		C¹		C²		C³		C⁴		C⁵	
C	33	48 C	66	77 C	132	88 C	264	D C	528	L C	1056	B C	2112
D	37	46 D	74	85 D	148	23 D	297	11 D	594	N D	1188	B D	2376
E	41	44 E	82	93 E	165	21 E	330	9 E	660	L E	1320	E	2640
F	44	43 F	88	32 F	176	20 F	352	8 F	704	K F	1408	F	2816
G	49	41 G	99	30 G	198	18 G	396	7 G	792	I G	1584	G	3168
A	55	40 A	110	28 A	220	16 A	440	6 A	880	G A	1760	A	3520
B	61	38 B	123	26 B	247	14 B	495	5 B	990	E B	1980	B	3960

Vibration rate

C	99.8	C	50	C	25	C	12.4	C	6.2	C	3.118
D	90	D	45	D	22.6	D	11.3	D	5.6	D	2.82
E	80	E	40	E	20	E	10	E	5	E	2.50
F	76	F	38	F	19	F	9.5	F	4.77	F	2.38
G	67	G	34	G	17	G	8.5	G	4.24	G	2.12
A	61	A	31	A	15	A	7.6	A	3.82	A	1.91
B	54	B	27	B	13.5	B	6.8	B	3.4	B	1.69

C	1.58				
D	1.41				
E	1.25				
F	1.19				
G	1.06				
A	0.955				
B	0.848				

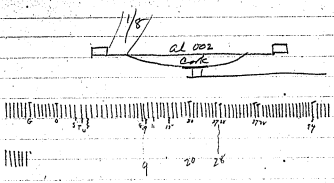
Closed tube rate

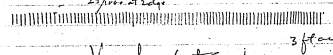
Brg Dia ⅝ 1½"

first Carlwheel design —

Cork

perfect test low — bearing
high rules fine —



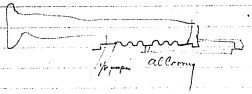


3 ft cover

Very low-but even —
must be made thinner

Base high even

Sept 20 1903 —



Te

Sept 20 1903

Trial of Rosin Cylinders

101 – Little roughness bottom, no jump – no chip – Big ball cuts in too much – with present weights – scratches more than Reg – not loud –

134 – Crystalized – but same characteristics as 101 –

135 – Same as 134 – ball dont sink in so much as 134 – track little brighter – its harder + with same adjustment as 134 – tracks little lighter – on verge of jumping out, track makes longer line Reg – white, thus to Cause wear of 101 + 134 as well – Method

Sept 20 1903

124 – Matted – Big Ball dont go in
scarcely any – tracking light
faltering a hender wax & guess
jumped out waves marks
on Record nearly as fine as
Reg –

129 – Jumped out – tracks lighter,
waves marks as fine as Reg
Big Ball dont mark it –

114 – Turning off machine turns
it rough outward – Big ball
ok – tracks light – jumps out

97 – Record smooth groove –
jumps out turns very rough
on turning Mac – Big ball
ok – waves marks as good
as Reg – Matted –

Sept 20 1903

123 – Not good Tens –

122 – Ruff surface – Tracks light up

121 Turns off rough – Waves coarser than Reg – jumps –

132 – Waves not so smooth as Reg jumps out – Turns Ruff –

110 Turns rough grooves smooth as Reg – jumps out –

133 – grooves not so smooth as Reg – not jumped as fast ~~Entered Sleeper~~ –

125 – grooves rougher than Reg – jumps – turns rough –

130 – grooves Rougher than Reg Crabbed – very little jump Big Ball goes in a little – turns ruff –

Sept 20 1903

127 - Rougher than Reg - jumps
turns poor - no holder at
tracks higher -

73 - Groove as smooth as Reg
very little jump ball shows
no dig in - This Record looks
ok Scratches little more
than Reg on Phono.

2 - Wave marks along - ball on
patches - at tracks deep
only little jump - Record
looks good, scratches on Phono
not same as Reg -

115 = Big ball ok - Tracks very
deep - Rougher wave surface
than Reg No chip,
Something wrong at 9 guess
scratches little more than Reg on Phono

9 - Groove Very rough - Chippy

Sept 20-1903

41 ~~[illegible]~~ — Big ball ok -
May be something in it

126 — Rough groove jumped out,
bad turned surface I

104 or 107 or 109 — Rough - jumps
Good —

90 — Rough - jumps little ~~[illegible]~~

57? — Two hard tracks shallow
all jumped out

34 —— ditto —

101? had 101 before — Rough - jumps —

98 — Chipsout Ug —

Sept 20 1903

15 ? – Worst chipping record 9
Even seen –

32 – Horrible Chippy Rg

49 ? – Rough groove, jumps –
Scratches only little more than Reg

54 = Fair - rougher surface than
Reg –

39 – Horribly Chipped –

75 FF – May be something in it.
Scratches more than Reg

17 Chipped

14 "

50 – Horribly Chipped yet big
Ball good in ? –

59 – Horrible chippy –

Sept 20 1903

68 – Chippy –

66 – Horribly chippy –

56 – May be something in it
Crackles a little from dust or
blows holes in scrapping at same no Reg
Generally Lean

105 = Fair – sometimes shade more
than Reg – Lean –

58 – Horribly Chippy –

70 – Chips slightly –

29 – too hard –

46 too hard

27 Chips too hard –

35 Chips – "

33 " "

53 – Jumpy – rather hard good enough
sometimes shade more than
Reg – Crackles

Sept 20 1903

30 - a little too hard -

26 - Hornsby chipped

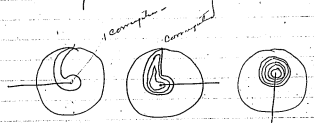
{ 111 - May be something in it
Too scratchy on Replay -
116 too hard -
108 Something in it -
43 Little too hard

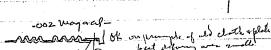
128 - no -

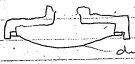
Tried many more of Roosevelt's records
not too hard for present reader -

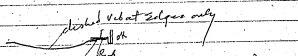
Sept 22 - 1903 -

Diaphragm Tried



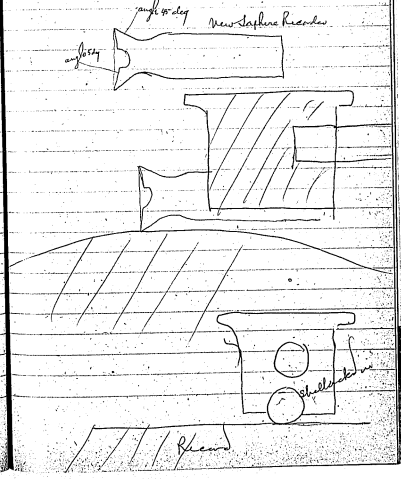




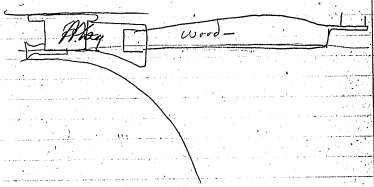


also put on Reader -
don't follow big waves but
also [illegible]

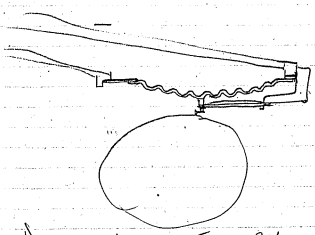
Sept 22 1902


angle 15 deg
New Saphire Breaker
angle 25 deg
Shell Breaker
Breaker

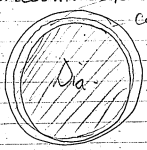
Sept 22 1903



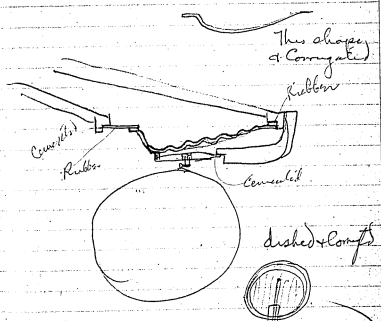
Sept 29 1903 —



Diapm put in eccentric Rub.
Cancelled

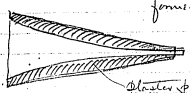


Sept 29 1903



Via mitted vibrating as a whole around 2 edges as like a Reed - Cemented to Rubber at one side + to rubber at other. This gives bigger amplitude on one side more light necessary hence Knife has to be placed to close leverage + not jump out

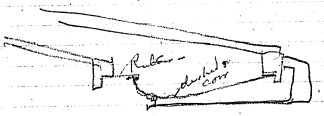
Sept 29 1903 TCE

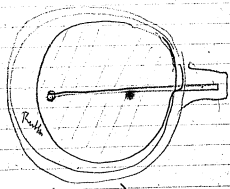


We are making a funnel with a curve of a large circle. it will be 38 inches long & should ~~produce~~ have a tone which should make an inharmonic disturbance in recording of notes 21 33 & 45 of which 21 will be least inharmonic 33 the most inharmonic & loudest & 45 not inharmonic but loud — with the 19 funnel No 9 21 & 33 were the disturbing notes on our piano having doubled the length with a curve of part of a circle & double the dia we should lower these notes one octave, should this be found to be the case then we can increase the length to say 9 or 10 feet by using a portion

Sept 29 1903 T.A.E.

of the arc of a larger circle & lower the funnel tone so the inharmonics will be so low than in most all pieces played they will seldom be used — we will be relieved of this horrible nuisance





Dia looks like a Read —
Lifelike with hand but w/ Rubber

Oct 7 1903

Chilling Crystalizable Torquine Salt
Etc in Copper mould immersed Cold
water to get amorph –
Punaton ng
Phenacetin – fours – harder than Reg
Paparoin – clear glass hard bottle
like Candy –
Diphenylamine Still Crystalizes – very hard
might do for a mix –
Cinchonidia Sulfate – decomposes –
Boroglycerine – boils up watery – chills
soft ng –
Diphenylamine Sulfate M.P. low – chills
fair on chill surface OK – brittle, hard
Ferr Cyanide – wants pressure to chill
to get smooth good surface –
Hexachlorobenzol rather high M.P. – 90°C
clear – fair signs of chill – comes
loose from mould – very thin outer
surface chilled – hard, cuts to powder
might do for mixing in a chilled mixture
acts as hardener –
Resorcinol, Resolve M.P. – comes loose
from mould split – semi amorp – very
brittle – mixer –

Oct 7 1903 –

Chrysolin salicylic – MP family low
Cinchonida – quite high MP – Crystallin
Acenaphtholeide – MP low – Crystalline –
Anthracene – Very Crystalline –
Chrysarobin – MP family high – chars –
Semi amorph – Carbinol's Lake Chrysarobin
Much harder OK for mix
Cinchonidine – MP family low – Semi
amorph – dirt stick – Second-ly hard – mix
Anthracinone high MP. Sublime
Chars semi amorp – Second-ly hard –
Antifebrin – MP little high – amorp
surface – very hard – semi bitter – good
for mix –
Acetamide – MP family low –
seems to deliquesce – Trans. not hard
deliquesce – might do for some
mixes – Chars well – semi amorp
on outside –
Acetolphenetidin Crude MP family high –
Crystalline –
Orthoamidophenol – MP family high
amorp on surface terrible bitter
Sublime – Mix

Parraamidspheral MP high clear
sublime some – amorp nearly all this
Very hard – mix –

	length S wave	frequency
100 Vib sec	134	33
150 "	89	22
200	67	17
256	52	13
300	45	12
350	39	9
400	33	8
512	26	7

No. of inches in 1120 ft

Vel of S at 70 Fahr = 13.440 inches =

4 | 448

12 | 112 (9.3
108
4

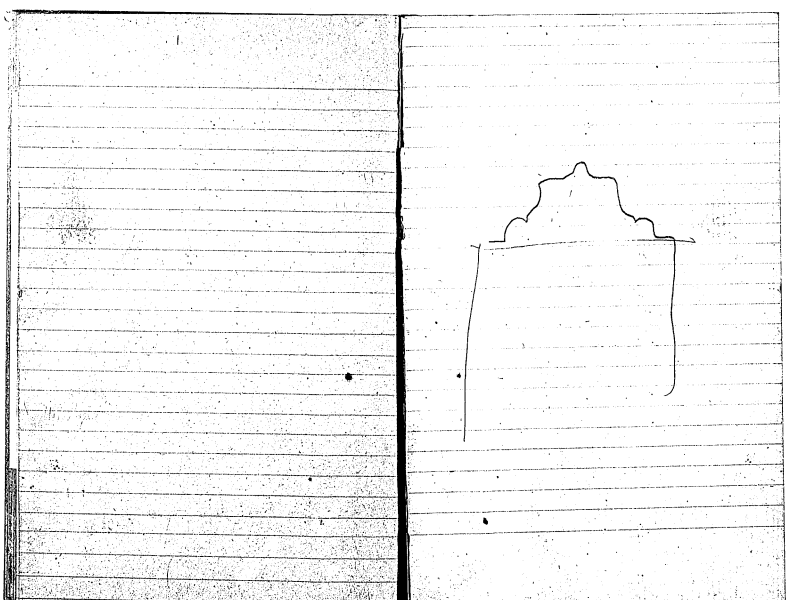
30 | 13440 (448
120
144
120
24

56 4 | 56
14

240 | 13440
1200
1440

2000 | 13440 (6.7
1200
1440

4 | 6.7
1.7



Notebook, N-03-10-00

This notebook covers the period October 1903-November 1904. The book contains notes and drawings by Edison and an unidentified experimenter regarding x-ray experiments. Inserted into the book are several pages of notes pertaining to the x-ray work. Marginal notations indicate that some of this material was recopied into an unidentified "big book." The pages are unnumbered. Approximately 40 pages have been used.

X E-172

N-03-10-00

Radiumic

Radium

Oct 1903 — Mar 1904

200 H. 3.27 O Nothing

~~382 R~~

382 R. 4th on 2nd
5th on 2nd
very very weak
4 on 2nd 132 Burns No 29 Magnetic Iron —
5 on 2nd 132 Burns No 28 Magnetic Iron —

213 S.R. 3.39 O Nothing

Nothing Finding F. 1904

Tiny Titanium dioxide,
Rutile, Brookite Titanite
Etc – Salmiac Ced –

194 H.
4th on 5th strong 35491 – 2 gr. U804 –
4th on 6th very faint
35489 25 mg U804

256 H. 3,48 0 Nothing

5-3 S.R.
5th on 1st strong 4698 – Cy Zr + Cy Didymium
1. on 3rd weak 4694 Cy Zr + Cy Thoria
8 on 4th weak 4806 Cy Thoria Cy Pb
5 on 5th strong 4757 – Cy Rubidium + Titanium
8 on 6th " 4813 Cy Thoria + Cy Selenium
4th on 6th " 4804 Cy Thoria + Cy Cy
3rd " 6th weak 4846 – Cy Yttria + Cy Lanthanum
5th on 6th " 4835 – Cy Yttria + Cy Erbium
7th " 6th " 4861 – Cy Thallium + Cy Cobalt
4th on 5th very weak 4661 – Cy Zr + Cy Hg
Probably more after
Extremely weak

1694 - 4 A.M.
4th on 6th weak 33980 - 50 mlg USO4
5th on 4th " 34990 9 mlg USO4 + 29 Pb Nit

26 5 - H.
5th on 6th very black 37765 - 29 gr USO4
4th " 6th very faint 37763 - 25 mlg USO4

64 S.R. 4.10
5th on 1st strong 2982 - Urani
4th on 5th 2979 = Oxalic CoOH + Carb Cu -
may be a spot only
make out of line

OK big book 5 1 ——

~~Pulled~~ Gross

OK big book

OK big book 9 1 ——

149 H.
3rd on 6th very, very weak
33254 2gr $K_2Mo_2O_7$ 50 mily Ca Borate,

Sag book

215th S.R.
7th on 2nd 20177 724 Mn Chloride
8th on 2nd 20176 Fe acetate formate + Citric
3rd on 3rd 20173 724 Mn Sulphate.
4th on 3rd 20172 Fe pyrophos + Magnesium Citrate
2th on 4th 20166 Iron + Quinine Citrate,
3th on 4th 20165 Iron formate
4th on 4th 20164 Ferromagnesium Citrate, Citric
~~[illegible]~~
6th on 2nd
All quite weak.

168 H
8th on 5th 34442 - 50 mily USO_4
6th on 6th 34363 2gr Ag Sulphate 25 mily $CuSO_4$
2nd on 2nd 33979 25 mily USO_4
all very weak

203 H
3 rd on 4th grey block 35971. 2qr U504
8 th on 5th block 35970 50 mlg "

263 H 0 Nothing

Okbyglook - ——

125 H
2nd on 2nd 31607 2gr Mn Cl 3 mlg Ca Silicate
3rd on 2nd 31603 2gr " 25 " Borate.
4th on 2nd 31604 2gr " 50 "
All very weak

Okbyglook S ——

8 2 S. R
7th on 4th Strong 1854. Uran
3rd on 6 weak 1922 Cerium Cl + Hg Cl

oblong book — S

oblong book — S

22 S.R.

1 on the 1st string 8143 - Chromic Chr Zr Cly
2nd on " 4th Gaily string 7928 Uran
6th on " 5th weak 7996 Uran
5th on the 6th weak 8066 Uran
8th on the 3rd weak 8018 Uran
7th on the 5th very weak 7995
Oxymaphthoic acid Na_2CO_3 + Zr (oh) -

20 S.R.

8th on 5th Gaily string
5523 - Uranium

7 S.R.
Great large
black spot here
the chamber
5th row about the middle
of the plate — weak.

8 S.R.

5th on 1st strong 6513 Uran Cinchoninic Sulph
8th on 1st not so strong 6442, Uran
3rd on 5th weak 6603 Sulphat Bis + Ammi
2nd on 2nd very weak 6533, Uran
No 3 on the 5th row
may be something else
not round.

Ok by book

4
1

Old big book

29 S. R.
7th on 3rd very black 7530 Uran
1st on 4th weak 7555 Uran
4th on 3rd very weak 7532
and half the diameter
Borobenzoic Ac & Na_2CO_3

4 S. R.
6th on 6th strong 6389 - Uran
2nd on 5th fairly strong 6426. Uran
7th on 2nd " 6367 Uran
4th on 5th very weak 6335 Auriln & Ba Chloride
1st on 1st small 6134 phosphotungstic ac & $BaCO_3$
spot, very weak, less
diameter -

Ok by book ?

36 S. R.
1st on 3rd strong 4657 – Uran
3rd on 2nd strong 4652 Uran
6th on 2nd a little stronger 4654 Uran
7th on 3rd very weak 4661
1st on 5th very, very weak 4661.
Uran

~~Zr Cl + Hg~~ bucced up –
Boric a^d Cold Uran + Hg –

32 S. R.
7th on 5th fairly strong 8546 – Johnd + Nitrate + Hg nitrate
3rd on 4th very weak 8521
7th on 2nd very weak 8495
ok by book Xylidin Nitrate –

Johnd + Hg (0) Cl.
Ok by book

Ok by book

81 S. R.
4th or 5th strong 2231 —
Uran Oxyfluoride

250 H. O Nothing

Alkalybook 5 1

209 ½
4th on 3rd 36343 - 2 gr PbFl2 2 gr di Bont
smaller diameter
very weak and
possibly
4th on 1st but 36469
large in diameter
and very, very faint
4th
alkaly book 2 gr Cu Arsenite & 2 gr Potass

18 S. R. Morning

Glibig took

111 H.

5th or 6th or 6th 307670
very male probably
plate shifted

2 gr di phos + 3 mig agcl

131 H. Morning

old cigarbox ?

balled Uranium

66 S. R.

8th on 1st Strong 2706, ~~with HF~~ + NH_4OH + H_2O

3rd on 6th weak 2723. ~~and HF + $CoCl_2$~~

2nd on 4th very, very weak
2736 HF acid + $ZnCl_2$ + $CoCl_2$

75 S. R.

6th on 2nd 1253 — Uranol-
very large diameter
black bluish center
very fuculiar

Cd. Cyanide Thorium Cy. ←
Casein Cy. and Cy of Al. ←
Ag. Cy " Thorium Cy. ←
Thorium and Thorium Cy ←

36427 2 g. Cu Arsenate 2 g U SO_4
36423 2 g. Cu Arsenate 3 mg U SO_4 ←
2 g. Cu Arsenate 50 mg U SO_4 ←
2 g. Pb. Fluoride 2 g Trium Phos. ←

2 g Ba Nitrate 50 mg. U SO_4 ←
2 g Ba Nitrate 2 g U SO_4 ←
2 g Ba Nitrate 25 mg U SO_4 ←
2 g Ba Nitrate 1 mg Sulphur ←

35 S.R.

- 1st on 6th Row Weak 4809
- 5th on 4th " " 4805.
- 5th on 3rd " " 4804
- 5th on 1st " Black spot small diameter No 4803

211 H

- 1st on 6th row very black 36423 36427
- 6th on 6th " weak 36426
- 3rd on 1st " very very weak 36391
  6th on 6th row is only weak by confusion with the 1st on the 6th row

198 H

- 3rd on 1st row weak 35646
- 3rd on 3rd " very very black large diameter 35647
- 1st on 4th row weak 35645
- 4th on 6th row very very weak 35686

2 g Cd. Bromid 50 mg U SO_4	←	3rd on 1st row weak 32204
" " " 2S " " "	←	6th on 1st " very weak 32203
" " " 2 g " " "	←	2nd on 2nd " very black big 32205
" K " 50 mg " "	←	8th on 3rd " weak 32060
" K " 2 g " "	←	4th on 5th " very big black 32061

134 H

Cerium Oxysulfid	←	4th on 1st row black but not big 20140
Lithium Formate	←	7th on 1st row weak 20137

218 S.R.

Boric Acid Carbonates of U and Z	←	4th on 3rd row black but not large 46556
Cyanides of U and Co.	←	5th on 3rd " weak 46066

46 S.R.

Oxynaphtoic Acid Na_2CO_3 + Pb O	←	1st on 3rd row weak 7991
" " " " + Sn O	←	5th on 3rd " " 7992
M. Phosphoric Acid $(NH_4)_2CO_3$ + U(OH) Na	←	7th on 5th " " 5313

49 S.R.

		30 S.R.
Nitrates of Na & U.	←	2nd on 5th row big black spot. 4336
Permolybdic Nitrate & U. Nitrate	←	7th on 4th " very big black spot. 4123
U Cyanide & Hg. Cyanide	←	7th on 5th " weak 4068
K Cyanide & U. Nitrate	←	8th on 5th " very weak 4034

There are a number of black spots on the plate, other than these, which have not been put down, These are probably flurescing from the big black spots

		87 S.R.
Sulpho-carbolic acid + K_2CO_3 + UNO_3	←	7th on 3rd row big black spot. 2543X
Sulpho-carbolic Acid + K_2CO_3 + UNO_3	←	8th on 3rd " weak 2543
Propionic acid + Hg	←	2nd on 6th " black spot rather larger 2520a
		54 S.R.
Tra chlor-phtalic Acid + UCO_3	←	2nd on 6th row big black spot 6076
Oxy-naphtoic Acid + UCO_3	←	7th on 6th " very weak 6026
		76 S.R.
Cu Cyanide + UCl_4	←	2nd on 6th row big black spot 1716

	264 H
2 g Pb. arsenate 50 mg USO_4 ←	5th on 6th row black spot rather weak small but good normal size 37764
	96 S.R.
Boric Acid Carbonates of U & Sb. ←	2nd on 1st row a little weak 4665
" " Carbonate of U. ←	3rd on 1st row larger blacker 45&2
P-Tolnidin Oxalate and U Oxalate ←	6th on 4th row big black spot 5941
	57 S.R.
Nitrates of Na & U. ←	2nd on 6th very large spot rather black 3258
	177 H
2g Li Sulphate 25 mg. USO_4 ←	3rd on 2nd row very very weak 34543
" " " 9 mg " " ←	7th on 4th " not so weak 34341
2g. Sm. Chromate 2g USO_4 ←	6th on 6th " Big black spot 34641

2 g. Na. Cl. & 2 g. U SO_4	←	6th on 4th row very big black spot 30424
" K Chloride & 25 mg. U SO_4	←	4th on 1st " weak 30416
" Sr " & 2 g " "	←	7th on 1st " big black spot 30448
" Cd Bromid & 1 mg. Ag Chloride	←	2nd on 2nd " weak 30453
" Sr Chloride & 2 g. U SO_4	←	7th on 2nd " big black spot. 30436
" Mn " & " " "	←	8th on 2nd " " " " 30454
" Sn " & 25 mg. " "	←	4th on 3rd " small " " 30446
" Li " & 2 g " "	←	7th on 3rd " very " " not large 30442
" Na " & 50 mg " "	←	8th " 3rd " weak 30423
304134 2 g Sr Cl 25 mg U SO_4	←	1st 2nd 4th " " 30434 – 30464
304164 " Pb Cl. " " " "	←	4th on 6th " " 30432
30432 2 g. Sr Cl 3 mg U SO_4	←	

10 R H

2 g. K. Sulphate 25 mg. U SO_4	←	3rd on 5th row a little weak 33565

16 I H

2 g. Pb. Nitrate 50 mg U SO_4	←	1st on 3rd row a little weak 34992
" " " 25 " " "	←	4th on 4th " " " " 34991
" " " 2 g. " "	←	4th on 6th " very big black spot 34993

17 I H

		261 H
2 g Ba Fluoride 2 g U SO_4	←	4th on 1st row very big black spot. 37681
		238 S.R.
Uranium Acetate	←	7th on 1st row Extremly large black spot ~ 21217
		91 S.R.
acid Hydro-fluric & Na_2CO_3 & $U(NH_4)_4$	←	3rd on 1st row big black spot 2684
Oxalic Acid NH_4OH + UO_3	←	8th on 1st " weak 2860
Oxalic Acid $MnCO_3$ + UCO_3	←	2nd on 3rd " big black spot 2894
" " Si_2CO_3 + U O_3	←	2nd on 4th " " " 2879
" " K_2CO_3 & " "	←	2nd on 6th " " " " 2663
" " Na_2CO_3 & " "	←	4th on 6th " " " " 2661
" " K_2CO_3 & Cd Cl_2 + UO_3	←	4th on 4th " small " " 2922
		185 H
2 g K Chromate 2 g U SO_4	←	6th on 1st row big black spot. 35245
2 g K Chromate 25 mg U SO_4	←	6th on 2nd " weak spot 35243

Oxalic Acid $UO_3 K_2CO_3 + CaCl_2$ ←
" " UO_3 " " $Al_2 Cl_6$ ←
" " UO_3 $Zn CO_3$ ←
" " UO_3 $K_2 CO_3$ $Mg Cl_2$ ←
Bales Lod 5 ←
Ba Oxalic ←

63 S.R.

2nd on 1st row black spot. 2922
1st on 5th " " " 2969
5th on 5th " " " 2994
3rd on 6th " small " " 2956
5th on 6th " " " " 826
7th on 6th " big " " 990

297 Trabolt
Light struck to be taken over.

179 H
attached by Acetic Acid fumes from the Stratina used in gluing Stout, Salicylate on paper.

392 R Nothing
390 R Nothing
395 R "
235 S.R. "
146 H "
147 H "
142 H "
178 H " over

185 H Nothing
212 H "
266 H "

Developed 26 February 1904

The following gave nothing

309 R
310 R
321 R
305 R
322 R
317 R
318 R
319 R
313 R
312 R
315 R
314 R
302 R
300 R
389 R

Burns
should be 1509 = 2064

1609 = Burns # 1895

1510 = " # 1896

1518 = " # 1902

830 Monzile sand Cabinet

1555 Burns 2001 = Lalcose for Stockbridge
E Barnard

1345 Burns 1719 =

319 R

5th on 3rd row black spot.
6th on 3rd row a little weak
6th on 4th row about the same
Indications of other spots
all quite weak except 5th on 3rd row

304 R

6th on 2nd row fairly black spot.

320 R.

3rd on 3rd row good black spot.

316 R

1st on 1st row weak and doubtful

980 Labradorite Labrador ← 4th on 3rd row fairly black spot.

1121 1510 Burns =
1122 1510A " = ← 1-2 on 3rd row look like spots

2.7 = Hydr. Chloride of Iron dried. ← 3rd on 4th row sure
3.7 = Bismuth Trichloride ← 5th on 5th row very peculiar, white with a ring around it 1" in diam. quite clear and sharply defined this is very strange and should be investigated!

307 R

3.11
A lot of rings on right hand end. May be Spots

2.97 Trabolt.

95 = Hg Oxid Ammonia water, Hydrofluric Acid

92 = Fe and Sulphocarbolic Acid

93 = Hg Oxid Ammonia water, Hydrofluric Acid

94 = Na Nitrate 1yr. Sti nitrate cryst.

681 = Aw Ba CO_3 (giv. Sm $(OH)_2$

393 Snahol

7th on 6th row very black spot, round.

456 on 6th row great big black blotch. Can not say if it is a number of black spots, or not. Seem to be other spots, rings.

No doubt about 7th on 6th row.

301 R

1st on second row seems to be a ring

303 R

Edison Ores

Spots very weak, may be rings there may be radium all through, It should be concentrated. Whole plate spots.

4.10
4.20
4.30
4.50
5.10
5.20

5.30

5.50
15.40

[ITEM FOUND IN BOOK]

301 R

1st on second row
seems to be a ring

303 R

Edison Ceres.
Nothing
spots very weak may
be rings they may be
radium allthough it
should be concentrated
whole plate spots

[ITEM FOUND IN BOOK]

393 ~~R~~ T

7th on with very Black spot Round
4-5-6 great big big black
blotch can't say if it is a
number of spots or not
to be like spots rings
no doubt about 7 on 6 Ukrain

389 R

nothing

[ITEM FOUND IN BOOK]

302 R
nothing

300 R
Nothing

[ITEM FOUND IN BOOK]

297 Trabolt.

3 on 4th Row shine

5 on 5th " very peculiar

the spot shows white with

a ring around it 1" diam

quite clear and sharply

defined this is very strange and

should be investigated

$InCl_2$

through double salt NaCl and

AgCl Nothing

[ITEM FOUND IN BOOK]

319R

5th on 3rd row
6th on 3rd " a little weaker
6th on 4th " about the same
Indication of other spots
all quite weak except
5th on 3rd row

321R

Nothing

[ITEM FOUND IN BOOK]

304R
6 on 2nd row fairly
black spot,

305R
nothing

[ITEM FOUND IN BOOK]

320 R

3rd on 3rd now good
black spot.

322 R

nothing

[ITEM FOUND IN BOOK]

318R
Nothing

319R

[ITEM FOUND IN BOOK]

317.R
nothing

316R
~~[illegible]~~
11st very weak
and doubtful

[ITEM FOUND IN BOOK]

307 R
4 on 3rd row fairly
black spot.

309 R
nothing

[ITEM FOUND IN BOOK]

310 R
nothing

311 R
A lot of Rings on R Hand
end may be spots.
1-2 on 3rd ~~[illegible]~~ look
like spots.

[ITEM FOUND IN BOOK]

313R
Nothing

312R
nothing

[ITEM FOUND IN BOOK]

315 R
Nothing

314 R
Nothing

Notebook, N-03-12-12.1

This notebook was used by Edison during December 1903. Most of the entries pertain to x-ray experiments. Included are notes regarding efforts to find sources of radium and to discover radiation in addition to x-rays. Near the end of the book are scattered notes and drawings relating to storage batteries and phonographs. The book contains 150 numbered pages followed by 11 unnumbered pages. Some pages are blank, and several pages have been removed from the back of the book.

2nd Talk [illegible] 142 H R
" " 98 H "
" " 201 H "
" " 191 H "
" " 55 "
Look out for last spot
2 mm Uranium
~~2nd Talk~~ ~~[illegible]~~ "

Dec 12 1903

/

Experiments to discover new rays, also to ascertain sources of Radium, photography 48 hole slides,

Slide. 253.
2 grammes of Sodium Borate 2 grms Uran Sulphate
2nd Row 6th

Slide: 160
Uran Sulfate

Slide 158
2 grms Zinc Iodide 2 grms URANIC Sulfate
3rd row

2nd Holding Confirms Tin Chloride
no Uranium on slide
also Confirmed by Washington book
300/5 Gram Tin Chloride —

Slide 114
2 grms Copper Phosphate 2 grms URANIC sulfate
very intense

Slide 223
Calcium Oxide S S S !

Slide 108
2 grms CHLORIDE of TIN S S S !
ray only comes through Celluloid strong
weak through Mica —

Slide 232
Sodium URANIC — very strong.

Slide 254
2 grms ANTIMONY ARSENATE + 2 mil Calcium Fluoride
Mica show more Transparent than Celluloid
See next page Probably Mistake on plate
~~Uranium 2 grms Sodium~~ 30 mil Uran Sulfate

Bulled up

taken 2nd time (black paper)
209448 - Ceric hydrate - looks yellow
& looks on Uranium sheet, try Ceric by
alone -

176
2 grms Lithium Sulfate + 2 grms URANIC sulfate.
2nd row No 6 -

234 on slide - 233 on book & box
CERIC HYDRATE.. Correct the mistake.

231 -
GALLATE + AMMONIA.
Top 1st = May be mistaken -

Slide 254 on celluloid side, although unmarked
Top or Micro side, Every hole is photographed
most of them strongly. This slide should be
rephotographed as its very strange every hole
comes out - some dark all over

219-

Top- Every hole photographed- think 1st hole top row is a black spot. — The first holes from top in 2 & 4th rows are rather dark —

233

2nd Hole on 2nd top row is rather dark, other nearly as good - left hand side shows more ring spots than right hand

234

No spots - phenom - plate dark all over

219

Bottom - Every hole shows left hand end strongest

225

1st hole bottom ring hole, strongest 1 2 4 3 top row next No 2 hole bottom row white center an faint ring longer than brown ring. Nos in bottom plate. 75% of holes (ring) photgd -

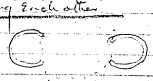
√

253 Top —

This was on p. 1st — Nothing peculiar except the black hole described under 253 page 1 —
Some ring holes on left, Top —

220 Top —

Thermo — 7th hole top — bleaches, extends to right & left so that ½ of ring photo cut off hole
6th hole 8 forming 2 inch other



on 3rd row holes 4 + 5 look as if center photo + rings did not repho the plate, nearly every hole ring photo) — shrinkage! to left

260 Top

Nothing peculiar about it's ringholes shows poorly.
Those t. left obliquely.

160 – Top

described on page 1 – nothing peculiar
ring spots strongest colonies length top row –
160 – Bot only high & low transport, no rings –

159 Bot

No spots – nothing peculiar –

159 Top –

no rings – nothing peculiar –

258 Bot -

Nearly all rung holes, nothing peculiar -

258 Top -

Nearly every rung hole shows faint notching peculiar -

260 - Bottom

Every rung hole strong throw to left boat,

166 Top –

Every ring shown shows except No 7 on the 4th row – this & [illegible] apparently & the ones are ring 50% larger than grey ring – & No 2 on 6th row looks small without ring, maybe a black spot, – spots to left slightly,

267 Top –

No rings –

158 = Bottom See page 1 Urn

166 – Bott.

Nearly all ring spots

267 Bot

No Ring holes

214 Bot

Nearly all ring holes string to the left.

214 Top

Nearly every ring hole - mostly very strong
some extra strong 1st on 1st row ~~[illegible]~~
first on 2nd row - 1st on 4th row 1st on
5th row 4th + 6th on 5th row —
There was a bleacher - no ring In a row
of strong rings there was No 7 on the 1st row
+ No 1 on 6th row - No 9 on 1st ohow
faint indication of a bleach spot.

231 Top — looks like bot as holes are small — of top. No 1 on 1st row very skinny ring — we only all rings shown except No 8 on 1st row which is a bleacher —

221 Bottom

Every ring hole out alcon as usually skinny strings over to left.

165 Bot

No rings — (faggs) —

114 Top

Only 2 or rings to left, (faggs) or clerk at left —

226 Bat.
Nearly every hole cut
1st and 2nd row bleached ditto 3rd
on 4th row — stringest rings to left.

226 Top.
Nearly every hole. 4th row No 3
a bleached + string to left.

221
Every ring shown — black spot in
Centre of 18th hole on 3rd row —
Stringest rings to left, This plate
has many oblong rings —

231 Bot

Badly fogged – 50% rings shown
No 1 on 6th row strong –

114 – Bot. See p. 2 Urau –

No 3 on 1st row – strong ring –
No 7 on 6th row bleached cuts
off 1/4 No 8 ring –
Strongish rings to left.

165 Top

1st on 1st rather may be a black
spot = Rings on abt 1/2
strong at left end –

223 Bat
Nearly all rings - Ilions to left using strong -

233 Bat
3rd Row No 3. Blendheim big ring - 50% rings strong to left = 1 2 3 on 4th row strongest

176 Bat See page 3 Uran -
Notice spot in ring 4. but it showed up poor on developing -
No 3 on 4th Row may be a block spot strongest to left
176 ~~Bat~~ Top - No 6 on 2nd row Uran doubt show much better than No 4 on 2nd row or No 2 on 3rd row - No 1 on 6th is block thing doubt show so on develop

220 Bat

Nearly all rings show strong
Illow to left strongest No 1 low
5 Illow + No 2 on 6th row
Strong No 7 on 1st row. Bleach

225 Top

Nearly all rings – 1st row No 1
& 4th row No 8 strongest.
1st row No 8 Bleacher.
3rd row No 2 bleacher with big halo
dotts No 1 on 5th row
also No 2 + 5 on 6th row – all bleach

232 See front page Illow

Illow Spot No 6 on 5th row –
Nearly all rings show No 6 on 4th
row opposite black spot Bleacher
rings slanted to left –
black spot in ring No 2 on 1st row
the whole ring is quite dark
232 Bat No 6 on 4th is also bleacher –
2nd on 1st row is darkest but now black spot

Plate 128
Shows 6 lbs. taken again. Curious spots on it, all the same shape

158 - See 1 page Uran
Nerings Uranic only spot,

108 3rd spot See 2nd page Chl Tin
Spot is 3rd spot on 3rd row
½ full rings strongest to left
1 & 2nd row 6th row strongest,
108 Top - 3rd spot on 3rd row
dots show up so well on this side.
8th rings on 3 & 4th row fourth
strong also 1st on 3rd & 4th —
2 grm Tin Chloride fuse

probably Sb Arsenic + 50% Uran. Sulph.

223 Top See 2nd page Ca Oxide
5 on 4th row is the dark spot
but real hay work nearly every
ring shows 1st on 1st + 2nd
row 8th on 5th + 6th row
3 + 5 on 6th row strongest.
No 1 on 2nd row + 8 on 6th row
are dark all over + may be spots

254 May be mistake here
See 2nd page Sb Arsenic + Cuff
This is good dark spot, its marked
bottom but from looks of spots it
is Top. If so then spot is No 7 on
4th row — If not it No 7 on 3rd row
plate shows nearly every spot,
slanting to left.

Replate

253 See page 1 Uran
Bottom — No 6 on 2nd row 6 Cracks spot
Nearly every ~~spot~~ ring shows —

53 slide —
2nd taking blank paper
4813 Thoria Cy + Selenium Cy
4804 " + Ag Cy
4679 Cy Zirconia + Cy Uranium
4746 Cy Rubidium + Thorium Cyl
4806 Thoria + Lead Cyanide
4694 Thoria + Zirconia + Thoria Cy —

Plate marked 53
Blank spot 1.04 on 2nd row —

128 bat
Plate shared 6a taken again
peculiar rings + spots the
1st lot —

107 bat
7th + 8th on 5th row has dark
Centers + white rings — faint —
6 7 4 8 1st 1/20 strong rings —
plate shared the duplicated

126 —
So poorly taken Cant tell anything
about it

118 = very. Coffee in it —

121 = Top
Plate too dark – Thank it should be
taken over again – rings very dark

124 – Top
Nothing special — bottom very
Curious. No 2 on 5th row white round
Opal with dark at Center, better
retake —

117 –
Nearly all rings brown nothing special
~~[illegible]~~

122 – bot –
Top row – No 2 ~~[illegible]~~ 4 5 ~~[illegible]~~ seems to be
black all over – 2 first are No 2 & 4

225 Top & Bot.
Nothing indicable —

123 Bot.
May be black spot on 2nd row 4 —
very faint ill defined. Might indicate plants
Top — So dark at one end that it could possibly be due to something retarded

234 — Bot see 3rd p — Carrie hyd.
No 4 on 2nd row — very black
Spot — 234 Top — 4th on 2nd very black

117 Top —
4th row — No 6 + 7 bleaching with halo ring No 4 bleaching on 2nd row with halo — 4th row

216 Bot.
Nothing indicable —

118 – Top –
all rings – nothing noticeable –

121 bat
all rings – nothing noticeable –

126 bat
Nothing noticeable –

216
8 on 2nd row 4 8 on 4th row white
bleaches, no halo
1/101 on 1st row pretty dark all over

107
So badly washed Can't tell anything
about it –

15 Dec 1903 22

Just finished developing 1 day slides –

159 – shows Black spot only see it on Celluloid side –

172 Celluloid side 1 faint + 1 somewhat stronger – (Black)

112 2 or 3 Black spots thinks Celluloid only

40 – Think there are 2 Black spots

58 Big black spot + 1 weak, strong on bottom or Celluloid but rather weak on Mica side –

236 – Big black spot. } celluloid
1 small "
probably 1 more –
one or 2 shown in Mica side – think

2nd take

21135 Uranium acetate

21111 – " Bromide

21132 " Sulphate

21115 – Chrom Sesquichloride

21112 – Nickel Bromide

Gross gone

" " = called up

236 Bottom.

5th on 5th row black – 2nd strongest 21115 = Chromium Sesquichloride, SRO.
21116 is probably at end of this row. This is a mistake on GCP. 21114.

4th on 3rd row strongest – 21132 – Uranium Sulphate,

1st on 3rd row 3rd strongest 21135 Uranium acetate,

3rd on 3rd row 4th strongest – 21133 – Bismuth Trichloride S

Probably some of 6th row No 1 very faint.
21111 – Uranium Bromide –

There is no other Uranium Chem on slide –

Nothing – 162 bat ✓

83 – bat ✓
One or 2 rings –

59 bat ✓
One or 2 faint rings

No 40 Top -

3/4 of all spots show - rings - perhaps some may be spots but doubt it.
This slides has phosphates + Barium platinocyanide
Chems mostly fluorescence & this may account for fact that rings on plate obscure most plates with this bottle gave very few spots + box closed for long time. Evidently ~~spots are~~ rings are caused by long lived phosphorescence - as it may be that Radium + X ray fluorescence held thru pho for weeks -

59 Top - ✓

few faint rings -

112 Bottom

30891 - 2 grms Ca Phosphate 2 grms Uran Sulphate
30903 " Ni Phos 2 " "
30915 " Fe Phos 2 " "
30885 " Hg Phos 2 " "
30855 " Na Phos 2 " "

40 Bot - ✓

1st or 3rd row - Borohydrofluoride double UCO_3
3888 -

217 Bat ✓
few faint rings –

109 Top ✓
Nothing

236 Top –
about same as bottom, See bottom, 236 –

217 Top ✓
Nothing

162 Top ✓
Nothing

138 Top
May be one ~~[illegible]~~
~~Nothing~~ NO Pon 1st row

This slide is evidently wrong

6q Bat

1055 Salicylate Na
1054 Iodoly
1116 X Sodium Creosotinate. S

3rd Lat – Dec 18 1903 27

145 Top –
Nothing. no rings

6q Bat

6th row 1st blackspot, 2nd ditto
3rd ditto faint, 4 ditto, stronger
5 6 7 4 8 all black spots
but weaker but unmistakeable.
No 7 4 8 on 5th row – black
but weak – No 5 on 3rd row
blackspot, This is a daisy

1053 Nit Ag
1051 Lead Oxalate Johnson S
1050 Dry Sleanate aluminum
1048 Cu Palmitate.
1047 Cd "
1046 Mg Tartrate
1045 Ferri et ammonium
1044 Magnesium Palmitate

2nd taking with black spot
Nothing

Nothing 45 top

191 - Top

Black spot, No 3 on 1st row
35 348 = 2 gr Na Tung + 1 mlg Cu Phos

25 Bat.

Strong reaction — No 8 on 3rd, 4th, 5th & 6 rows bleached —

149 Bat.

No 3 & 4 on 2nd row may be black spots, halo of black about are —

33240 2 gms KI + 25 mg BaFl —
33240 2 gms KI + 9 mg BaFl.

33 Top

Blackspot, No 6 Bottom row

7702 Monochlaetic + Na_2Co_3 + Ur. Na

45 bott

No 2 on 5th row - black faint

4791 Granule Thorium + Cy Ammonium

69 Top

6th row 1st weak 2nd strong
4th strong 5th little weak –
6th strong ▽ +8 weak all
black – ▽ +8 on 5th row
strong · 1 of on 4th row
strong – all spots not sharp –

This sticks all balled up as the spots are all yellow + look like Uranium –

5 Top

4 on 5th row very faint & black
5 on 5th strong.
4 on 4th row strong 5 on 4th
row stronger - 7 on 3rd row strong
I think that 7 on 3rd row is a black
spot very faint dotted 7 on 4th
row - There may be other weaker
ones -

7th in 3rd row - Uranium Oxal + Ur Oxalate

7th in 4th row Sulf Ur + Cobalt,

5 Bot.

No 4 on 5th row weak: No 5 on 5th row strong — No 4 on 4th row fairly strong No 5 on 4th row stronger No 5 on 3rd row pretty strong

No 8 on 6th row. bleached.
ditto 8 on 5th row.

6439 - weak. Sulphate Ammon + Tin
6440 strong " " + Zinc
6425 fairly strong " " + Calcium
6423 stronger " " + ammonia
6433 pretty strong " + Lead
6522 bleached Ammon Sulph + Na_2SO_4
6445 " chl Ammon + Barium —

137 Top
plaster too dark to see anything

136 Bot
Nothing —

88 Bot

Nozpots, 1st on 6th row very darkrung
May be a spot.

2567 v Acid Sulphuric + $UO_2(NO_3)_3$

249 Bot —

No 6 on 3rd row good blackspot,
plate full very strong rings —

37033 2gr KBrite + 2gr Uranic Sulphate

33 Bat

X06 on 6th row good black spot
see Top

87 Top

X07 on 3rd row alternate black spot
very strong rings on the plate
2543 X Acid Insoluble + Not Uranium

21 Top -

No 1 on 4th row may be a spot.
3 & 4 on 3rd may be spots.
No 3 on 4th may be one, & No 2 on 5th
but all doubtful — perhaps bad plate
will settle it —

5510 Boro-tungstate Ba + Carb of K + Ba
5463 Phos a + Of Hg + Carb Tin
5461 Phos a Hgo. + Carb Cd
5508 Boro tungstate a + Carb K + Nitl y
5501 " + Carb of Bismuth

237 Top

No 8 on 1st row - very black spot,
Looks as if 3rd & 4th on 2nd row & 2 & 3
in 3rd row were faint black spots -

21192 Uranium Sulfate.
21189 Silver Sulfate
21188 Mn "
21182 Hg Iodide
21181 Cd fluoride -

Pallets No up 2188
marked 21188 –

237 bat.

8 on 1st row good black spot,
4th on 2nd row looks like one –
8th 1st row – 21192 – Uranium Sulfate,
4th 21188 – Mn Sq.

87 bat

No 7 on 3rd row very black spot –
2543 X acid Sulph Gamboie $4K_2CO_3$ + $UrNO_3$
No 3 on 2nd row big spot,
2553 – acid Sulphanilic – $MgCO_3$ –

2nd taken bleaches pair
2 spots weak spot weak
one more spot weak
look at plates

55 Top

39

No 5 on 2nd good black spot
8725 Para Iodudin Sulf + Ur Sulfate

55 Bot

weak black spot No 5 on 2nd

1 2 3 4 4 5 top row bleachers

No 6 on 2nd row is a bleacher
with black mods ? –

8725 – see top plate
8719 Para Iodudin Sulfate + Cd Sulfate
8691 " " Nitrate + Pb Nit
8716 " Sulf Pb Sulf
8744 Xylidin Iodide + CdCl2
8748 " " + CaCl2

Nothing — ~~245 Top~~

104 Bot

No 6 on 1st row - ~~No 7 on~~
2nd row - No 8 ~~on~~ 3rd row
black spots not strong —
~~No 3 on 2nd 3 on 3rd + 1 on 4~~
may be spots plate too dark to see

6 on 1st row	30489	2 gr Ca Cl	2 gr Uran Sulfate
7th "	30472	2 gr Ca Cl	" "
"	30460	2 gr Ca Cl	" "

Doubtful 30535 2 gr di Cl + 25 mg Ca Cl
" 30497 2 gr Hg Cl 3 mg Ur SO4
" 30598 2 gr Ca Cl 1 mg Sulphur ?

Plate (Not here only left half)

140 Bot

all rings -

140 Top

No 5 on 3rd ring 62 a spot

plate too dark

52 bot 42

N08 on 1st blade weak
4767 – Cy of glucinum & Cy chromium

52 top

N05 on 3rd blade weak.
N08 on 1st may be a spot.

Nothing 244 Bot

Nothing 244 Top

Nothing 99 Bot

" Allrings 244 bot

~~104 T/p~~
~~6 on 1st line be spot — plate too dark~~

~~99 T/p~~
~~Nothing — plate too dark~~

~~141 Top~~
~~Nothing no rings —~~

~~24 Bot.~~
~~No 6 on 6th row good black spot. some slow rings —~~
~~5203 — Phosphat + Carb Uranium~~

24 Top

faint black rings No 6 on 6th row
some sling rings

72 Top

some to 6 z cyl rings –
sling rings – 5th row 74 to bleaches
ditto 8 in 2nd row + 8 on 3rd row
bleaches

No O.

Black spot faint 1st on 2nd row
" 8th on 2nd row
" 8 " 3rd row
" 7 on 3rd row sling
4882 No 1 on 4th row very z a spot.

4881 – Cy Phlem & Cy Uranum
4803 Cy Thoria & Cy Uran
4834 Cy Ytrum & Cy Uranum –
4863 – Is in shiz not in book –
4882 Cy Glucinum & Cy Didymum –

X Something wrong stuff in Redbook.
"unintelligible see if got right spot"

32385 with book is
2 gr Sing. Sod & 2 gr Uranyl Sulf
2 gr Sing. Sod & 2 gr Uranyl Sulf

Just Book
2 gr KI Br 2 gr Uranyl Sulf

145 Bat

Contrasce any op at, fine ring plate dark

137 - Bottom.

Black spots No 5 on 6th row
" No 7 on 6th row
both strong no ring on plate
X 32385 - 2 gr Na Phos 25 mg Zinc Cyanide S.S.
32361 2 gr KI + 2 gr Uranic Sulphate.

167 Top

Black spot No 2 on 5th row.
Very ill defined -
34443 = 2 gr Ag Sulfate ~~2 gr Calcium Fluoride~~ 2 gr Uranic Sulfate.

86 Bat

No 2 on 6th row 30 seconds 4546
on 6th row bleaches = 102 on 3rd row
bleaches all ring. very strong No 7 on 4th
row strongest ring

Potaking with 6Ca & elk pap.
6 in 6th Row —
Borax & Cand Urom & Ba

Potaking pap No 11 —

Probably all balled tip

4556 ClCd & ClMn
4519 ClMg & ClMng — } mistake
45211 ClMg & ClPl
~~4555~~
4555 — ClCd & ClZinc
4553 ClCd & ClPSr
4515 ClCa & ClCopper ammonia
4508 ClCa & ClMn
4440 NaCl & CoCl
4439 — NaCl & NiCl
4433 NaCl & MnCl
4507 CaCl & ZnCl
4417 KCl & FeCl
4444 NaCl & BiCl
4396 Nitrate Alum & Nitrate Cerium }

180 Top
No 2 on 2nd row very strong rings

238 Bot
~~Strong rings No 1 & 2 1st row~~
~~Bleached dull 1 & 2 on 2nd row~~
~~bleachers~~

No 11 Bot.
Black spot. 3rd on 1st row.
" 5 on 1st row
" 7 on 1st row very faint.
" 2 and 3rd on 2nd row
these two have white trade respectly brass ring on other side apparently —
Black spot 2nd on 3rd
" 5 on 3rd
" 1 2 3 4 5 & 6 on 4th row one
apparently spot.
No 6 on 5th row spot.
all spots are quite weak & there are many very strong rings —

8 Bat
apparently all rings —

43 Bat
Every part filled with very shiny rings —
Black spot weak — 1st on 3rd row
7904 phosphorous acid — H_2CO_3 + Zr (OH)
Record 43 Top

167 Bat
full very shiny rings — Na5 on 1st
may be a spot, ~~it has a white halo~~
~~7904 phosphorous acid H_2CO_3 + Zr (OH)~~

72 Bot

Nos 5 on 5th row in my 62 a spot - doubtful

249 Top

Black spot 6th on 3rd row
370 33 = 2 gr K Rorate 2 gr Urunsinfo

141 Bot

only rump

136 Top

nothing

88 Top

Nothing —

151 Top

Nothing

56 Bot.

No 3 on 3rd may be spot, also 5 on 3rd – there are some very strong rings that may be spots.

No 4 Bot

No 6 on 6th row black spot, plate full very black rings some may be spots –

6389 = Amilin Sulfat + Urean Sulfate.

56 Top

full bladerings - No 2 on 4th row may be a lapat, & No 3 on 1st lo

7 Bot

Every ring pkot'd

23 Top

No rings - see 23 Bot -

256 Bot

Apparently all rings

25 Top

4th on 3rd Row may be spat,

149-Top

No spots -

240

2nd on 4th row may be spot
36595 2gr $Bi(NO_3)$ 2gr $UrSO_4$

172 Bot.

5th spot on 2nd row Black spot
34269 - 2gr Cu Iodide + 2gr Uranic Sulfate

168 Top

Nothing no results

53 Top -

8th on 4 or 5th row doubtful

53 Bot.

No 6 on 5th row good black spot
74.5 on 6th row black
No 4 on 6th row black

4679 - Cy Zr + Cy Uranium
4813 Cy Thor + Cy of Selenium
4861 Cy Thallium + Cy Cobalt,
4804 Cy Thor + Ag Cy -

213 - Top
nail

172 Top
possibly 5th spot in 2nd row doubtful

213 Bot
Lots spots -

257 -
possibly 7th spot on top row
& 1st on 6th row - both doubtful

127 Top.
Nailing

Nothing 96 Top

211 or 215 Top

Nothing

215 Top or 211 —

Nothing

62 Top

Nothing

~~100 - Top No 7 on 3rd row black~~
~~No one on 2nd row black~~
~~No 8 on 2nd row black~~

215 Bat

No 3 on 3rd row may be a spot

191 Bat.

No 4 on 1st row spot
Examine again accounting amt No 3 on 1st Row

168 Bat

1st on 1st row bleaches 2nd on 1st row dots
4 on 1st row probably Black spot
No 1 on 2nd row bleaches

240 Bat See Top-

No 2 on 4th row Strong Black spot
No 2 on 5th possibly a spot.

39 Top

Nothing

146 Top-

Plate too dark cant see

175 Top-

Too dark to see anything

23 Bot

1st 1st row block.
1st on 6th row good block
2nd on 6th row fount block
4th on 6th "
3rd on 6th very fount "
1st on 5th row block
1st on 2nd row fount block
1st on 3rd row fount "
1 on 4th row fount "
2nd on 4th row fount "
Thinks there are others - plate darkened
Should be taken again -

257 Top

Too dark to see

64 Top

Too dark to see

256 Top.

Rings no spot -

64 Bot

Every ring plated strong - no spots

2nd Pattern
well

62 Bot
1st on 2nd row Black
7th on 4th row Black
3rd on 1st row probably a spot,
Maybe other spots plate dark
Retake —

~~180 Bot.~~
All rings —

263 Bot
Seems to be all rings - plate dark

147 Top —
Plate dark Cont see

263 Top
Plate dark Cont see

262 Top
6th row 3rd spot strong. Black spot

263 Bot
Plate dark - well

26 Top

Nothing -

36 Bat

All strong rings -

42 Top

Nothing

192 Top -

2nd Row No 4 strong Black spot

35449 - 2 gr Kilos 2 qr Ur 504 -

192 Bat.

2nd Row No 4 very dark ring probably

a spotted ring very conspicuous

Two Blacks peculiar bat

6 Blackbirds 4 walls of the shown

26 Bat.

Lots of Blackbirds

1 2 4 3 4 5 on 6th row Blackbirds

1 4 2 on 2nd row Blackbirds

11 Top

No 3 on 2nd Row Black

No 1 1st row Black with white tab

No 2 on 3rd row Black with white "

There are 8 6 6 yellow spots, but

plate looks dark —

261 ~~Top~~ Bot
1st Row No 4 Strong Cock spot
Thermometer marked [illegible] Rings
Very strong & well covered & plate thick-
37681 2 gr Baffles 2 gr Ur 504

Developing notes 48 Horn

184 H = Very black spot at end on both.

230 SR maybe some spots on Top all rings on bottom

68-SR 5 Black spots on top row & 1 black spot on 2nd row and 7th spot on bottom Corresponding one on 2nd row very black

Think 68 has been arranged for 5

69- investigate —

32 SR only rings

107-SR string rings both top

167H – strong rings may be
spot on bottom –

46 SR all rings – big halo
around end hole both plates

43 SR – Bottom, strong spot
rings yet weak? –

39 SR only rings –

63 SR Top row near end very
black spot with both plates +

183 H – Bottom is only all
Blemishes few rings of Rows
walls of slide black? –

228SR – all rings —

47 SR may be spots on top possibly bottom —

261-H Top seems to be full black spots but they don't show when plate held front red lamp. Bottom plate shows black spot. Outer row near middle.

19 SR only rings —

113 H. Eight black spots on top & show black colour held front red lamp. Don't seem to be corresponding ones on bottom. Latter seems be rings – Phenomenon. Notice that colour gelatin form offrings are recorded on glass just no alternating ? ?

263-H. possibly one spot
but 3rd row moose —

~~5~~ 7 SR Bottom One black
~~spot~~ Blotch & one or 2 blenches
no black spots —

20 SR Nothing

266 H — Extremely strong rings
both plates —

262 — 1st row 3rd from end
good black spot on both
strong on bottom —

134-H Black spot
2nd row on top & bottom, another
on bottom faint —

97 SR – Rings only

76 SR 1st or least row
Corner strong ring but black
all over may be a spot, bottom

77 SR There is a strong black
on top about 2nd or 5th row.
not shown on bottom – There is
two on bottom approximately not
on top plate look at this carefully
one of bottom is faint. rings are
strong –

4 SR Very black ring on
outside row bottom plate.
may be faint spot on top plate

56 SR – 3rd from Edge – 3rd or
4th row Top plate, seems to be
a spot

238 H all rings

No 8 SR May be three on
Top at bottom row of top plate,
& corresp'g rings rather black on
bottom plate 1/8 thick —

180-H Seems to be spot on
Top plate 2nd row with pin hole
in center — all rings on bottom

26 SR Top — about middle row
3rd from end possibly a spot;
Corresp'g very black ring on
bottom — on bottom half
bleachers —

147 H nothing

192 -H 2nd Row 4 or 5 from end Black spot, both plates —

86 SR Top near end 2nd near middle row thick spot. Bottom, lots rings, several good bleachers

146-H. only rings —

36 SR on top near end small white halo. on bottom at another place a halo, but larger,

15 SR All rings - another piece gelatin torn off rings on glass only just as strong S.

81 SR Bottom - Black spot 2nd row middle. apparently same on top but dont show in front of Lamp.

No 11 SR Top seems to be good black but dont show in how held front near Lamp

42 SR Extremely strong rings on bottom - plate moved - all

Day previous
24 Hours

169 H = dots rings all strong on bottom may be a black spot in Corner of Top none on bottom

177 H. Bottom row on bottom plate seems to show one of rings black in middle 3rd from end I think —

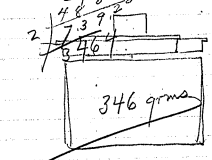
178-H. Strong rings bottom.

171-H good black spot on top + bottom plate. last of 1st row about middle.

264-H. I think they are all rings on top — bottom all rings. possibly there may be a faint black on

188 H only rings
70-H "
185 H "

480
154
92 0
24 0
48 0 0
2 | 7 3 7
346



480

288 | 4460 | 154.
288
1540
1440
100
14

4 | 3.20
15
1600
320
4.800

256-H Strong rings

212 - all rings some strong

102-H Very peculiar plate
2 rings top bottom black as
midnight near middle - awful
black on bottom one over on
side. also on bottom plate near
a corner 2 or 3 black spots
I think - run this down? —

257-H - Bottom in Corner
Black spot thick top
has it & perhaps one other.

256-H. Strong rings Bottom

243-H - Bottom & Top
3rd or 4th Row - good black
Bottom strongest, near middle

213 SR Lots rings -

27-H plenty rings no black
spots apparently -

161-H - Rings -

265-H Bottom One black
spot on 1st or 6th row -
4th from one end Cant see it
on Top -

175-H all rings

34 SR Bottom one Black
Spot. 4th or 3rd row next to
end one, Sure not strong.

96 SR Seems to be faint
Blackspot 2nd and 5th
last hole Top plate,
Same on Bottom plate looking
through plate front light
dark spot but see much
one bottom faint, possibly
only rings —

64 SR Rings —

23 SR Bottom — Black
Spot in one Corner & near it
faint spots of smaller diameter
Main Rule II

174-H Top - at one end
Lowes held plate up before
developing (to saw spot
phosphorescence) it developed
Black - Bottom side
Nothing - Bottom - peculiar
spots at places bleached &
square shows spaces between
holes -

240 H. Bottom - one Black
spot 3rd or 4th row -

168-H - Lots rings but
disappear on further
developing. -

Phenomenon — Notice
when put plate in developer
dent cover a certain
area at once this area
developes white the cover
if kept in much longer —
Natural like on Zi plates
that accordingly dent cover
at once, is it Electrical?

53 — Top one in Corner Bottom
one in Corner & one on
same row further along
bottom one strong one on next
row —

191-H Rump bottom plate

215 SR Bottom – 4 excessively black rings one jet black, all over but disappeared on further developing none seen. through light this is peculiar run it down to get the rings in developing again phosphorescence? guess – no black spots –

145 – Nathan

No-5 Bottom + Tops show three Blackspots about middle 3 rows but in line dots rings strong – apparently six spots on bottom three on top probably six, one on the bottom is very strong

69 – Bottom plate 4 or 5 Black spots & many strong rings. Top plate Black spots in both corners & in other parts of the plate seven spots on the bottom or top row – Two spots on 5th or 2nd one spot on the 3rd or 4th near middle.

No. O – 3 spots together near one Edge 2 other spots in Corner Bottom full of rings – Same Three spots & spots in the Corner

24 – Top strong rings do bot on bot or top may be a black spot

21 — Bot-strong rings. Top faint rings. think big black spot on top very muddy spread covering large area ill defined, Bottom same —

33 — Bottom - Black spot on 1st or 6th row - faint — Lots rings —

52 = Top — Big black spot in Corner also Bottom very strong rings on Bottom. the big black spot strongest in bottom plate

72 = two faint black spots on bottom + some rings on Top

87 – Both plates full rings –
Top plate 3rd or 4th row
2nd from end Very black spot
Bottom plate ditto not so black

237 Top plate – in Corner Very
Black spot fine.
On Bottom – Black spot in Corner
also 3rd or 4th row 2nd from end
Exceedingly black ring – there are
a number of black rings bottom

149 – Rings on bottom

62 – Bottom plate Black
Spot 2nd row on end – Top
few rings

45 = Rings

25 - Rings - on Bottom one large black area double size of a spot.

99 — Bottom one very black ring

244 - Ring

140 "

245 - Bottom - very large halo - one or 2 ~~large~~ strong rings

104 = Three black spots, one Exceedingly black ring on bottom possibly more black spots on top One Black spot, several rings but plate very dark Can't see well - black spots not strong but ring black

137 – ~~two~~ faint spots on Bottom 1st or last row – Nothing on top –

141 – Rings

136 Nothing at all –

88 – Possibly one spot on top few rings Bottom full rings one in Corner may be a spot, one ring very black

55 = Spot on 5th or 2nd row possibly another spot on 1st or 6th row – rings very strong One black spot in Top Bottom spot quite black Top spot faintly black –

249 – Much Black spot on Top – good black spot on bottom 3rd or 4th row – full rings all –

113 Top + Bat Disinfectant Part

No 2 on 1st row olive 30927
2 gr Bismuth Phos + 2 gr Uranium Sulfate
8th on 1st row — 30879 —
2 gr Pb Phos + 2 gr Uran Sulfate
7th on 3rd Row ✓ 30909
2 gr Ag Phos 2 grms Uran "
30867 4th on 4th row.
2 gr Lithium Phos 2 gr Uran Sulfate
5 6 + 7th on 4th row weak spots
30860 Uran —
30907 "
30945 2 gr Ca Phos 2 gr Ca CO3 S
Spot very weak & doubtful —
30873 Uran
30861 Uran
30921 Uran
30949 Uran —

243 Bot, + Top

5th on the 4th row along spot
36769 - Uranium - 1 spot

256 Top

Rings -

~~[illegible]~~ 58 Bot + Top -

Nothing
6th on 3rd row along black spot
3003 — Oxalica + $CdCO_3$ + $UranO_3$

169 - Top

Nothing

227 Bot + Top

Nothing

39 Bot.

Only Rings

No 2 Bot

All rings - but most of them dark Centers.

65 Bot

Nothing

97 Top -

2nd on 4th Row Black
4642 — Uranium -

91 Bot

All rings

139 Top

Nothing

241

4th on 1st row very strong black.
36649 — Uran Sulfate, Pb Cy both 2 gr.

150 Top
Nothing

185 Bot.
Only ramp

178 Top
Nothing

154 Top
Nothing

154 Bot,
2nd on 4th row is blackening that blends out string magnetite or spot.

22 Top –
All Ramp – not will work

109 Bot.
No 2 on 2nd Row strong
30055 Uran Sat finite.

This is a Bull Chesloff's white
May be arsenic acid - Run down

2nd taking blackpropp
2300. Arsenic & Uranium
2394 = Molybd Uran

84 Bot.
No 1 on 2nd block
No 8 on 5th Extra Black - best yet.
2300 Metallic arsenic - ss.
2394 Chl Uranium

174 Bot
4 5 & 6th Row Blanches

34 Bot
Rings -

175 Bot,
Every hole a ring Contains any if any are spots

34 Top -
Nothing

74 Top
Nothing

150 Bot
Nothing

2nd Taking
2 gr CuBr 2 gr Brown Sugar
2 gr BiK + 2

241 Bot
Strong blackspot 7th on 1st Row
There are many ring which are ringy but
dark in Center also, 36649 –
See Top –.

84 Top
1st on 2nd Row 8th on 5th Row Blackspots
See Bot –

134 Top –
2nd on 2nd Row Blackspot good.
4th on 5th Row " gd dif. ring
34126 2 gms NaChromate pd 48 hrs to 2 gms Zinc Cyanide
34115 – 1 gms 5 oz Mellow Rend. 3 oz pd 90 Sh only Phenol's Blade –

82 Bot.
No 7 on 4th row blackspot –
1854 BaCy + ChPlatinum –

No 7 on 2nd Very clear white halo + ½ cent. 1869
black – ditto 7 on 3rd not so clear –
think No 3 on 2nd row is a spot,
1869 – 7 on 2nd SrCy + HgCl
1850 – 7 on 3rd BaCy + HgCl
1839 – 3 on 2nd – BaCy + MnCl –

Another balled up

63 Top –

7 on 6th Row Black spot good
5 on 5th " faint,
5 on 6th " faint –

990 – Oxalate Barium } ? ? yellow phosphorescence,
2994 – Bates Rod } ? ? white this –
826 – Oxalic acid + $ZnCO_3$ + UO_3 –

63 Bot

7th on 6th row – Black spot strong,
5th on 5 Rows probably split,
5 on 6th "
See Top.

151 Top –

~~3rd on 4th Row~~ Nothing

132 Bot

3rd on 4th Row – many bz others 142 on 6th,
31977 2 gr Na Br 2 gr Urea Sulphate,
31858 2 gr BiCP 1 mlg Ca Thos } ?
31878 " 9 " Ca Borate } ?

2nd Color

1797 — Cy Mn + Ur Cl

4603 } Glint — Borrec a Carb K + Uranium

4623 — Borrec a Carb Nat Bismuth Clock behind Vip

4660 weak — " Uranium + Fe

4658 weak — " Uranium + Ni

Thumb Nail is bulbed

4603 which is Uranium

Nat Bismuth Carb

Lustrous Cook

7th on 5th 4623 Borrec a + Carb Nat Bismuth

1st on 3rd 1797 My Cy + Uranium Cl

4th 2 1809 Al Cy + Mn Cl

6th on 5th 4295 Nat K + Nat Ca

89

112 Top

4th Row — No 2 faint

4 Row No 3 good

Many tiny white

30855 — 2 gr Na Phos + 2 gr Uran Sulfate

30885 — 2 gr Hg Phos 2 gr Uran Sulfate

83 Top

Nothing —

134 Top + Bat

Thumb Nailing

16 Bot + Top

~~Spots~~ — Rump —

139 Bot

7th on 2nd Bismuthinite

allotriomorphic Rump —

77 Bot

7th on 5th row strong Black

1 on 3rd " "

4 on 2nd Weak Black

6th on 5th shows upper Grossular image or white Quartz

77 Top
7 on 5th slimy spot.
1st on 3rd

138 Bot.
5th on 2nd Row in sale - Amp to see
32157 2gr Sr Br + 2gr Uran Sulfate.

230 Bot
all slimy Ramp —

228 Bot + Top
all slimy ramp —

79 Bot
Ramp —

47 Bot, + Top —
6th on 5th Row along —
Plate full very slimy Ramp —
6145 Phospho Tungstic a + Uran Cl2

2585 - is not marked) Q
& none other in book

Nothing 183 Top

246 - Top - + Bot -
8th on 2nd Row -
36871 2 gr Li Borate & 2 gr Uran Sulf -

186 Bot
Very strong Phosphs -

197 Bot
Extra Strong Phosphs - Eosin-yellow shows

85 Bot,
1st on 2nd Row may be spot
6th on 2nd "
2592 a Hydrofluoric fluorine a + U (NH4) v filter
? 2585 Q Hydrofluosilic a + Cu Co3 filtrate?

All bailed up - wrapped with 69 -

Milling - 110 Top + Bot. - may be some spots. -

Rings 156 Top -

Rings 224 Top

Rings 15 Bot

Rings 68 - Bot

All bailed up

No 1, 1st Row
No 2 "
No 3 "
No 4 "
No 5 "
No 6 "
No 1 on 2nd Row -

Rings, 81 Top

Rings 79 Top

183 Bot,
Thin plate of new Blenchers on
wood between inches

119 Bot
All strong rings

74 Top
Rings –
1 3rd & 5th on 1st Row Blenchers

119 Top
Very strong rings –

193 Top
No 4 on 6th Row – blackspot

35347 2 gr $NaWO_3$ + 2 gm Urau Sulf

Rolled up —

Ruings — 124 Top

See 68 Bat — 68 Top

Ruings 184 Bat

184 Top ?

No 8 on 3rd Row very black ~~spot~~
Not shown at all on Gallium plate —
35737 2 gr Nacl Sesquit + 2 gr Urea Sulfate

Ruings — 15 Top

Ruings — 230 Top

81 Bat.

4th on 5th row Block -
maybe other -
2231 - Uran Oxyfluoride

246 - Bat
8th on 2nd Row

89 Bat.
Some Bleaches, clear,

125 Bat
fully all rings

80 Top
Rings

89 Top
Rings

135 Bot

8th on 3rd Strong black
2nd on 4th row " " "
3rd on 4th " "

8th - 32265 2 gr ZnBr & 2 gr Uranyl Sul
2nd - 32289 " BaBr " "
32313 " NaIodide " "

229 Bot

No 2 on 6th Row - doubtful -

20774 - physostig min Hydrobromic

115 Bot.

all rump -

133 Top

No 2 on 3rd Row - doubtful -
32014 2 gr KBr & 1 mily Ca Fluoride

2nd lakey blended of Sulphonic & Urea Ammonia
7505 – Sulphonic pseudo Cumol "
7605 –

(guess this using Ring & indend spots)

133 Bot

Ring –

115 Top

Possibly some spots Cant say

73 Bot

Ring –

28 Bot

No 1 on 1st row strong – Nothing on Top –
No 2 " 2 on 4th " – " weak smaller dia
" 7 " – sulphonic pseudo cumol + NaOH –

Spots on this plate are extremely strong.

7504 – Sulphonic a + Zr (OH)
7397 Phtalic + Zn CO_3
7505 – Sulphonic a + Urea (OH Na)
OK

Doubtful –

170 Top

Rings

120 Bot.

3rd on 4th Row –

31173 – 2 gr BaCl 2 gr Uran Sulfate

195 Top

Nothing

206 Top

Very Strong Rings –

204 Top

5th on 3rd Row blackspot

36049 ~~4~~

2 gr CaNit 2 gr Uran Sul

247 Top

Rings

60 Top

Nothing

120 Top -

3rd on 4th Row - See Bat,

206 Bat

Allstrong Rmp -

49 Top

Plate too dark to see anything
5th on 4th very large spot vs. very weak
3rd on 5th - " " "

12 Top + Bot

Rmp -

98 Bat.

2nd Row -

No 1 30176 2 gr. CdCl. 1 mily agcl.
No 2 30202 2 gr. TlnCl. 1 " agcl.
No 3 30204 " 9 mily agcl.
No 6 - 30206 " 50 mily agcl.

2nd Row Nothing

98 Top

Plate too dark see anything

229 Top –
Too dark see nothing

153 Bot
Nothing

163 Bot
Nothing

190 Bot
Nothing

44 Bot
Rings – too dark to see

54 Bot
Rings too dark to see well

25 Bot
Rings too dark to see

54 Top
Rings –

37 Top
Rings

Boiled up & thinned
as part is white
probably S went off & left in
solution —

25 Top

Ring

44 Top

Ring

28 Top

7th on 1st Row - black
2nd on 4th Row " faint. 7605 —
Sulphopsedowcumolacid + Ultra Ott Na

198 Top

Ring

142 Bat

No. 1 on 6th row - pebly & pat
32643 2 gr Zn Phosphat & 12 gr Sulph.

80 Bat

Ring —

224 Bat

Zylva & Swing ring "

2nd take (Black powder, Cu Cl + 2 UranSO4) 30430 – All runs into lower of Sat eight Sr. increase spot.

Very Sensitive Instrument

211 Bot
All rings – Xtra Strong

197 Top
Strong rings –

125 Top
Rings

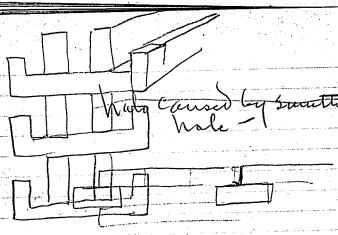
198 Bot
Rings –

207 Top
4 on 6th Row – spot, 36217 (PbCr + UranSO4)

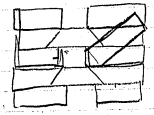
207 Bot.
4 on 6th row spot.

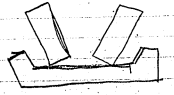
90 Bot
Rings

103 Bot.
4 on 5th row – 30466 2gr PbCl 2gr USO4
8 on 1st " 30478 2gr PbCl 2gr "
2 on 2nd row 30435 2gr PbCl 5 amp USO4
probably 2 + 3 on 6th row.
5 } 30477 2gr PbCl 5 amp USO4
3 } 30430 2 CuCl + 2gr USO4



Wing caused by exactly hole -





170 Bot 2gr $PbNO_3$ 2gr CaCl.
possibly 7 on on 2nd 34975.
5 on 4th halo begining

73 Top
plate too dark

204 Bot
5 on 3rd black strong
36049 2gr CaNit + 2gr $UrSO_4$ -

135 Top -
8 on 3rd row strong 32265 .2gr ZnBr 2gr USO_4
2 on 3rd pale -
32324 .2gr NaI + 50 mg H pcl -

49 Bot
plate too dark

147 Bot
Strong rings - too dark to see

60 Bot.
6 on 2nd Row spot, 3107
~~photo~~ + $BaCO_3$ + WO_3 -

190 Top
plate too black

202 Top
plate too dark —
Bot-rings —

19 Bot.
Rings —

93 Bot
Rings — too dark to see

95 Top
1 on 2nd row pale
89865 M- Xylin oxide + U Oxalate

199 Top
Strong Rings —

13 Bot
4 on 4th row bza spot

78 Top
Too black to see

Xylidine + U Oxalate
4 on 2nd } 94 Top 8963
2 on 5th } 9001 Contaminated Cerite Mn + Pb
plate very dark.

78 But.

4 on 1st row
5 on "
6 " "
7 " "
8 " "
4 on 2nd row
6 "
7 "
8 "
6 on 3rd

} very faint.

180 Top
Too black to see

13 Top
Too black to see

235 But
Ruy —

19 Top
too dark to see

37 But
Too dark to see

2nd Tiny Nothing

Ch Tin least (race)
piece Ni ore forming dark
Check –

94 Bot.
4 on 2nd pelly

Ruy 131 Bot.

124 Bot.
Think Lat spots 2 alike –

74 Bot.
~~3~~ on 1st row mybe spot + halo.
1 + 5 on 3rd row blanches

Ruy 201 Top
Ruy 201 Bot

380 Rafn Top
Shows lat blanches
plate too dark:
380 Rafn Bot.

~~Pro 8 on 6th Row good spot,~~
~~4 on 4th row –~~
~~1 on 1st pennacy~~

Using plate, see what chems are

Prbly other spots
on 101

Using plate
See what chems are

198 Top
3rd on 3rd row
ditto 198 Bot
35647 .2g. $BaNO_3$ 2g. USO_4

205 Top
Rings

101 Top
4 on 5th prbly
101 Bot 1
1 on 1st row
4 on 5th row
2 on 6th row
205 13 of.
16 on 4th row
5 5 6 + 7 on 5th row
1 5 6 7 + 8 on 6th row Very white
halo Reg sig + dark center — 5 5

116 Top
Rings

Looks yellow 5

2nd taking 3 black paper 5.5

3959 - Hypophosphate + Bi Cub 1.1

Wrong 3 guess -

plate being used
9 st Chem -

What are these?

38 Top Hypophosph + Bi Co3

5 on 1st - 3959

4 on 3rd poly 4 other poly

3872 Mica + SnO 5

116 Bat

Very strong rings

106 Bat.

1st on 3rd strong black spot

5 on 3rd poly

106 Top plate too black

10 Bat

Plate very dark thumb thin spots

10 Top

ditto

93 Top

Rings -

38 Bat,
Show white halo square —
5 on 1st poly spot,

199 Bat
All very strong rings —

Test bat

253-H Top + B both
plates very dark.

61 SR Top
3rd on 4th row strong spot ring like
3214 Pb a + $PbCO_3$ + PbO.

61 Bat
All rings —

209 — Top
4 on 1st Row extremely black ring
on edges with a black section of ring
on 5th of 1st Row — Bottom plate
Exactly corresponds.

Kirchl

36469 — 2 gr. Cu Arsenate & 2 gr. Potassium S S
Water wood omitted on
both sides — only holes thru wax on plate
Phenomenon —

Natural Cell book

Phenomenon

Little books marked 216.

This is strange as there is no stuff in hole, see plate again —

14 Bot + Top —

3 on 2nd Row }
6 on 4th " } may be opal.
Bot doubtful except 3rd on 4th which is likely
4458 4374 $Sr(NO_3)_2$ $Bi(NO_3)_3$
4373 $CaNO_3$ $AgNO_3$ —

18 Top + Bot

3rd on 2nd Row both places but the Edge of ring intense black on both
This is a Phenomenon
70 75 - Borehole of Chromic w $NH_4)_2CO_3$ + Pb @ 1/2 —

218 Bot

4th on 3rd Row Open hole. 20124 Cu + Alk of Nitrate.
7 on 1st Row 20137 Lillian formate.
Can notice other
Bottom 218
4 on 3rd Strong.

35 Top + Bot

Nothing

75

1st Row Six Bleachers

~~Slide under also marked~~
239 - which book is marked 238

~~not so~~ —

200 Top + Bot
Both plates full strong rings.
Orange.
as new way div in dark lohnw very few rings

203 Top
3 on 4th Row

203 Bot
3 on 4th Row —
35971 2 gr K IVO3 + 2 gr Uran SO4 —

238 Top
2 on 3rd Row 21230 7 o Protochloride ?
7 on 4th Row Both Strong 21217

238 Bot
Duplicated — Uranium Acetate,

29 - Top
7 on 3rd Row — Ditto Bot plate
7530 Methylsulfonic ac + U (OH) Na -

Not in bat.

51-Top+B

Nothing

81 Top

7 on 1st

81 Bat.

7 on 1st not so good.

382 Rafn Top

4 on 2nd Row 6 Blackspot good

133-Magnetic Grand Isle Somerset Vermont,

382 Bat.

Nothing-

381 Rafn

6 on 5th Row probably

59-Quartz & pyrite Bangle mine N Carolina.

30 Top

7 on 4th Row 4123 Pb NO_3 & $Ur NO_3$

2 on 5th Row 4336 $Na NO_3$ $Ur NO_3$

30 Bat.

data + unadulterated

6 on 5th Row 4301 $Na NO_3$ $Sr NO_3$

Developed plates Bot & Top
show only rings no spots
Where is top,

248 – B + Top
Nothing

210 – Bot.
5 on 3rd Row 36478 2 gr Cu Chrom 9 mlg KCy
6 " 36457 2 gr Cu Chrom + 2 gr Ba Pt
7 " 36463 2 gr Cu Chrom 2 gr Sr Pt
1 4th Row 36474 2 gr Cu Chrom 50 mg Zn Cy
2 " 36481 2 gr Cu Chrom 2 gr KCy

252 Top
2 on 5th Row black spot.
252 Bottom
Same — 37183 2 gr Ca Bor 2 gr Ur SOy

67 T + B
Nothing

208 Top
7 on 1st Row good
208 Bot
Same — 36319 – 2 gr Pb Pt + 2 gr Ur SOy

17 B+Top

Nothing

50 B+Top

Nothing

194 Top

4 on 5th Row

194 Bot

Same 35491 - 2gr Na Mo + 2gr Ur SO4

250 T+B

Nothing

155 Top+Bot

6 on 3rd Row } Very strong
6 on 4th Row }
no other rings

156 T+B

157 "

Nothing

33393 Li I + Ur SO4

33471 Ba I + "

S S

2 gr Cadmium Iodide + 2 grs Sulphur
is this OK S S

Color is right – What does it mean
No strong Urea Stale on stronger
is 24 milg – Maybe action
of the free iodine –

Just taking Sulfur 2 gr off
CdI 2 gr

No 36 ov

Looking up in book find it
is 33567 2 gr CdI + 2 gr Urea Sulfur
Above is mistake of the old boys

152 – Top
7 on 5th Row. 33567
152 Bot
Same but stronger –

111 Top
4 on 5th row 36629 2 gr ZnCl + 3 milg Sulf
6 on 3rd row doubtful 30677
Bot 4 on 5th row – doubtful
2 gr MnCl + 3 milg KCy –

41 – Top
3 on 1st Row – 3773 Sulphosphate of Urea
Bot. 2 on 3rd Row: 3842 Melonic acid Urea CO_3
3 on first row
2 on 6th Row 3180 Phos of $MnCO_3$ + $PbCO_3$ –

2nd Taking blackpaper

2 of Acid Hydrofluoric + Na_2CO_3 + $PbCO_3$ 55 strong

" " + $Al_2(OH)$ + Urea Ammonia.

Thus Fluorescin Rodamin Jetty

~~Got Chl of Cu Chl. Acetate Ether~~

Developed plate show good spot

other spots correspond lid crack

116

66 Top

6 on 2nd row 2732 Hydrofluoric + Zn + Mg CO_3

2 on 5th row 2736 " + Zn + Co CO_3

8 on 1st row 2706 Hydrofluoric + NH4 + HgO.

Bat. 8 on 1st Row.

127 Top

Original.

2 on 2nd row 31601 2gr MnCl + 9mlg Li Borate

5 on 3rd " 31573 2gr MnCl, 25mlg Ca Phos.

5 on 2nd " 31600 " " + 1mlg Li Borate

2345647 on 3rd row

234567 on 4th row

34567 on 5th row

Look in spectrum

7 on 6th row 31614 2gr MnCl + 9mlg ZnCl

2 on 2nd row always spt.

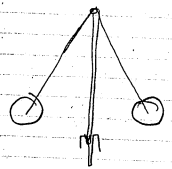
Bottom ~~7 on 6th row~~ all above doubtful

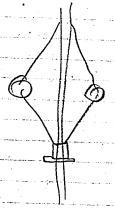
The following were taken 2nd time, without Rump - using black paper & results recorded —

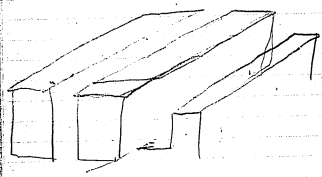
77	55	100
142	53	142
18	232	98
23	103	201
382 Rufa	82	191
238	66	55
98	11 —	23
201		18
191		
38		
84		
236		
204		
28		
134		

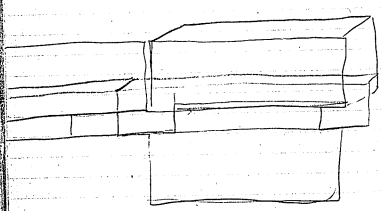
Had nothing on after 40 hrs.

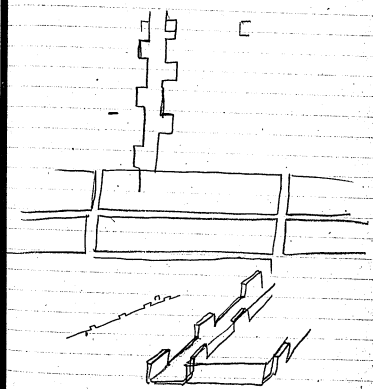
~~Rufa [illegible] 3 spots on [illegible]~~

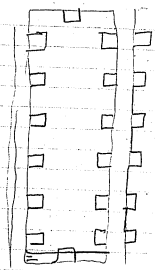


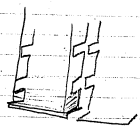












in green 68% Ni -

$Ni(OH)_2$

59
34
93 | 590 (63.4
558
320
279
41

$Ni(OH)_4$ - 4

256
60
1536

59
3

256
634
1024
768
1536
762.3

1000
630
370

·298 per amph

$Ni(OH)_2$

256.
7

1 gram $Ni(OH)_2$ to 370 grms OH.
" $Ni(OH)_3$ to 180 "
$Ni(OH)_4$ 740 "

from $Ni(OH)_2$ to $Ni(OH)_4$ - gives 370 gOH, gives 1.24 amphours

if from $Ni(OH)_2$ to $Ni(OH)_3$ - 1/2 that or ·62 amphours

298 | 370 (1.24
298
7260
5960
1292
1192

if from $Ni(OH)_3$ to $Ni(OH)_4$
·62 -

Hence 256 at the lowest
6 | 256 obtained gives 1.587 amphours
62
512
1536
1587.2

figuring on auby

NiO to Ni_2O_3
78.6%

$NiO\,HHO$
$NiO\,HHO\,HO$
NiO - $HHHOO$

59
16
75 | 590 (78.6%
525
650
600
5400
786
214

1 gram NiO to Ni_2O_3

$NiO\,H_2O$.
$NiO\,H_2O.O$.

NiO. ·2140 X

NiO. - 786 milg Ni.
NiO 214 " O -

1.572 - milg Ni.
642 - milg O -

634 -

2.36 per mg-hr

NiO HH-O

Ni(OH)$_2$

NiOHH

NiOH$_2$O -

NiO to MnO$_2$

126 mg OX

60

126 | 298 | 2.36
252
46 0
126
126 mg 8. per sym

63 -

634
20
126.0

59
32
93 | 590 | 634 -
558 | 36.6 -
32
570
41

Developing notes

132-H. On 1st + last row very strong rings

241-H Strong black spot. near Corner both plates

154-H 1 very black ring on top about same place

22 SR - Bat all very strong rings one very faint one may be a spot. as uniform all over + no ring to 3rd or 4th row 3rd from end.

84 SR Top + bat plates shows 2 black opals one at one end one at other + both in row next to top or bottom strong - bottom at 1st was a ring.

82 SR. abt middle near end both plates. black spots. its one sided + shows thus on both plates. Strong rings on Bat.

16 SR Rings -

139-H. Rings strong.

134-H - No rings on either ?

150 H Bat - May be a spot 2nd or 5th row about 4 or near.

105 H - Top + B. Both have very strong black spot, thinks there are wrong ones

193-H. Top + bat row have black spot. bat plate corresponding but black ring with black behind it

212
288
1696
1696
424
61056
180.

288 | 1800 (6.25
1728
720
576
1440
1440

2 | 288 (1.6
1
10.88
3.4
1.6
204
34
544

.625
340
625
340
2500
1875
21250

206-H - Both plates show slings at rings yet seen -

247-H - T+B all rings

60 SR Bot - 3 on next to last row spot Top plate, Cant see,

10 SR Develop bad changed to old develop. Top - may be black spot near middle! Bot, Rings - too dark to see.

38 SR all rings

93 SR T+B 1 spot in middle row.

44 SR Spot 4th on 2nd or 5th. Top Cant be sure plate dark.

251-H Rings
37 SR "
54 SR "
202 H. "
190 H "

NH_4Cl $NiCl_2$ 33.7

14
4
32
64
114
58
172

172) 580 (3.37
516
640
516
124

19 SR T+B 4 or 5th on outer row black spot

493 R Rings
98-H = Apparently 2 spots on bottom plate or may be ring slant out quite dark —
Can't say about Top plate

12 SR Ring
170-H - Bot = 1 big halo
White Center big ring
1 very weak spot Yellowish
229 SR Top - 2nd from end

28 SR top = 2nd from 3rd row.
2nd on front - very black Bot plate.
2nd on bot row not so good as Top plate —

235 SR Rings
13 - SR - Excellently strong Rings
78 SR Seem to be on Top.
1 2nd row with white ring
on Bot 3 or 4 with white rings
plates too dark to see well —
Top plate spot dont show when
head front and lamp —

95 SR Blackspot weak on one end

131-H - Rings

180-H - "

242-H - Top — two black spots one strong Bot - One black spot middle very strong pbly other

199-H - Extraordinary black Rings really every hole came out

101-H - Top — 2nd or 2nd row or 5th row - Bot - One very black on 2nd or 5th row

198-H - Big fine black spot Top near middle row ditto Bottom or a strong ring

119-H - Rings
201-H - "
120 - H - Black spot both plates 3rd from end

94 5R Bot – 2nd row mid black spot think one on top –

205 H – Bot – on end middle very black ring Top – rings strong.

380 Rufn – Very black spot Bot – in Corner but shows as ring when held up to red light.

106 H Bot – Black spot 2nd row 3 strong rings Top of bottom row in line –

124 H May be two spot

116 H – Rings

74 5R – Top – apparently two black spots. Bot – undecided

195-H - Top — Spot aft middle
only rings in bot plate.

103-H - Bot - Blackspot 2nd
row - ditto in Corner - Top —
blackspot 2nd row

73 SR Top - Maybe two spots
on end — Bot - ditto two blacks
Corroply & Unmk -

90 SR Rings

153-H - Rings

48 SR — 5 blackspots
in row Bot + Top plates
Bot 1 blackest spot —
Top row — p.bly more

198 H Rings
267 H — Top — Weak black
spot top row - Bot —
Corroply blackspot

80 SR Rings —

204-H – 3rd row No 4
both plates strong black spot

197 H Bot — Probably 3rd
Row 2nd spot.
Funny Top shows no rings in
developer but holding to light
shows strong rings

110 H – Top — Possibly two
spots near middle — Bot —
strong rings Count here.

211 - H – One in Corner good
Bot – Nothing to correspond.

144-H – Bot – Bleached +
halo spots may be weak
black spot – Top – rings –

105 H – Bot — 3 black
spots in row one strong
one on end.

133 H Rings
115 H "

85 SR two black spots on top one strong — Bot — two or 3 black rings one Corresp'dg to top.

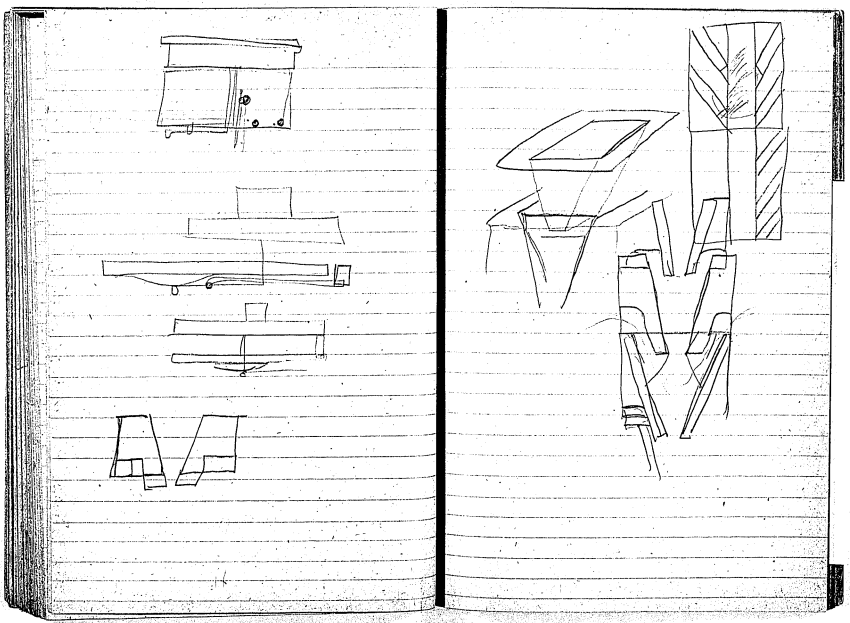
142-H - Think may be 2 or 3 faint spots on Bot — one on Top plate

163 H - Maybe 1 or 2 black spots both plates poor

246-H - Top — 1st on 2nd row strong — Bot — Extra black ring Corresp'dg but rings but blacker than other rings —

89 SR Top — 2nd on 2nd row black spot — Bot — Cant say — lots black

186 – Rungō –



176
72
95
1232 71
124

180
71
126
127

178
71
178
177

52

220
52
94
110
127

1246
125

177
71
177

170
72
98
60 —

1239
52
210 127

120 —

125
120
250
125

105
19

21 169
71
169

125
250
150 watts

169
71
169
125

128 amp 125 average Dio U 150 watts, 219 input,
50 watts Saved — 169 — input

60
500 Hour

219
60
31.9 — 10c $1.31 —

196 169
60
101.9 — 100 — 31c Saved 1.0
1.55 5
7.7 22

150 watts — 219
60
9.00 150 — 219
150
69

69 watts Heat

150

290
52
58
145.0
150

290
52
142
5

280
52
56
140

285
52
57.0
142.5

215
71
215
150.0

214
71
142.4
149.9

150 watts output — 290 input 52% Effy
150 " 213 input 71 "
140 watts Heat
60 " "

43% less heat

17 Kilowatt — $ 1.70 —
12.7 127
43 cents Saved at 10c

213
150
63

290
150
17

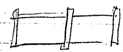
290
60
17.9

213
60
127.9

140
42
98
56
50

1.00
.002
7.8"

6000
1000
24
3
72.



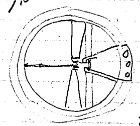
1.25
125
625
250
125
1.5625
80
1.350000

1.55
1.35
775
465
155
1.35 209.25

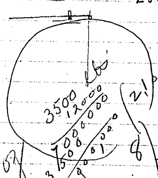
209 grms

10

600 | 1728 (2.88
1200
5280
4800
4800



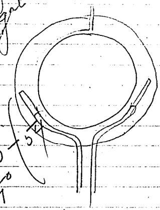
288 | 44600 (155.1
288
1540
1440
1400



3500 lbs
120000
7000000
3500
120
40
20 | 4
40

21000000
8 | 2100000 (4370
60 | 2625
240
225
180
45
42

50 gals min
500 gal min
80
4000



80 | 4370 (54
4000
37

4000
20
80000 3HP

$NH_4Cl\ Ni''\ Cl_2\ 6H_2O$

— 14

100

Anhy - $NiCl_2\ 6NH_3$

18

20%

59 17 102 ? 34%

102
64
166
59
225

14
4
32
64
12
96

225 | 590 | 4500 | 1450 | 222 | 118 | 340 | 1190 | 1020 | 760

(34

222
59
281 | 1590 | 1280 | 280

(20

Notebook, N-03-12-12.2

This notebook covers the periods December 1903 and March-June 1905. All entries are by Edison. The book contains notes and drawings regarding x-ray, storage battery, and phonograph experiments. The entries from 1903 pertain to the same x-ray tests as those entered in N-03-12-12.1. Among the storage battery items are a memorandum concerning the formation of European companies, notes regarding the design of cell grids, and a one-page layout of a battery factory. The phonograph drawings include a 2-page entry entitled "phono suspension for automobile." The pages are unnumbered, and one page has been removed from the back of the book. Approximately 110 pages have been used.

Al.
Boron
Mg
Ce
Be
Mn
Mo
W
Cr
Va
} acid

Co
Ni
Fe
Cu
Ag
Hg
Sb
Sn
Pb
Ar
Bi
Zn
Cd.

Reducing agents -

11

December 12 1903
Experiments to discover new Rays, also,
Radio Active chemicals and crystals
photographing the 48 hole slides,

SLIDE 253:
2 Black spots Bottom plate
1st Fused, 2 gr NaBorate 2 gr Uranic Sulphate
Top plate, nothing peculiar except the black
a black hole.
253 Bot. No 6 on 2nd Row is black spot.

SLIDE 160

1 Black spot. Uranic Sulphate

SLIDE 158

1 spot fusion 2 gr Zn Iodide 2 gr Uranic Sulf

SLIDE 114

No 5 1st Row. Fusion 2 gr CuPhos 2 gr Uranic Sulf

Investigate

SLIDE 223.

1 spot Calcium Oxide?

223 Bottom nearly all rings

Top- 5th on 4th row is the dark spot, its rather weak. No 1 on 2nd row + No 8 on 6th row may be spots.

Investigate

SLIDE 108 Top.
Fusion - 1 spot 2 qr Chloride Tin S
ray weak on top side strong on bottom
108 Bottom - No 3 on 3rd row brick spot

Note, bleach both sides

SLIDE 232 Top
1 spot very strong Sodium Uranate
Nearly all rings show. No 6 on 4th row opposite
black spot is a bleacher, black spot in
ring of No 2 on 1st row. whole ring
quite dark.
232 Bottom No 6 on 4th row bleached
2nd on 1st row is darkest but now black spot

254

1 spot fusion 2 gr SbAr + 50 mlg Uranic Sulfate

176 Top -
No 6 on 2nd row, fusion 2 gr Li_2SO_4 + 2 gr Uran SO_4

176 Bot notice spot is ringy but it showed up fair on developing. No 3 on 4th row may be a black spot, strongest to left.

Correct it.
Investigate.

234 on slide - but 233 on wood base + little book
1 spot Ceric hydrate

Investigate

231.
Top 1st Gallate of Ammonia?

219 Top-
Every hole photgd - I think 1st hole top row is black spot. 1st hole from top in 2 3 + 4th rows are rather dark.

233 Top
2nd Hole on 2nd Top, is rather dark, others nearly as good. left hand side shows most rings

233 Bot – 3rd row 1 to 3 - bleacher + big ring

234.
Phinomenon- Plate dark all over

219.
Every hole shows left hand end strongest

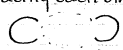
225 Bot

1st hole bottom ring hole strongest 1 2 & 3rd Top row next, No 2 hole bottom row, white center & faint ring larger than brass ring, this is bottom plate.

225 Top. nearly all rings 1st row No 1 & 4th row No 8 strongest 1st row No 8 - bleacher No 2 on 3rd row bleacher with big halo. ditto No 1 on 5th row - also 2 & 5 on 6th row bleachers

220 Top

Phenomenon - 7th hole Top, bleaches extends to right + left so that 1/4 of ring photo cut off hole 6 + hole 8 facing each other



on 3rd row holes 4 + 5 look as if center photo, rings didn't.

220 Bottom No 1 on 5th row + No 2 on 6th row

Very strong rings - No 7 on 1st row Bleacher

260 Top + Bottom.
Nothing peculiar.

159. Bot
no spots nothing peculiar
ditto Top.

258. Bot + Top. nothing

~~258 Bot~~. 159 Bot + Top Nothing
258 Bot + Top "

Investigate

166 Top
Every ring shown clear sharp. except No 7 on
4th row + this bleaches No 2 on 6th row
looks small without ring. may be black spot
spots to left strongest
166 Bot nearly all rings

Investigate

267 Bot + Top
No rings on either S.

214 - Bot.
Ring holes
214 Top No 7 on 1st row + No 1 on 6th row former faint indictns of being black spot,

231 Top No 8 1st row, a bleacher
231 Bot, plate fogged No 1 on 6th row strong ring

165 Top
1st on 1st row may be black spot.
165 Bot only rings.

Retake.

Investigate

Note

128.

Curious spots on this all same shape

53. Bot ? =

No4 on 2nd row black spot.

53 Top 8th on 4th or 5th row - doubtful.

53 Bot No 6 on 5th row good black spot.

4679 = CyZr + UrCy

No7 on 6th row black spot

4813. ThoriaCy + TeCy ? ?

No 8 on 6th row | 4861 | ThalCy + CoCy

No4 on 6th row black. ThorCy + AgCy

Note
Investigate Bismuth Trichloride

236 Bot. + Top –
5th on 5th row 21115 – that is Cr sesquichloride
but this is a mistake should be 21116 which
Uran chloride, Boys marked wrong.
No 4 on 3rd row 21132 Ur SO4
1 on 3rd " 21135 Ur Acetate
3rd on 3rd row 21133. Bismuth Trichloride
No 1 on 6th row very faint 21111. Ur Br
There is no other Uran chem on slide,

Get Top -

162 Bottom & Top Nothing

83 Bot. & Top Nothing

59 Bot & Top - filings

112 Bottom

30891 2 gr CaPhos 2 gr $UrSO_4$
30903 " Ni " "
30915 " Fe " "
30885 " Hg " "
30855 " Na " "

112 Top. 4th Row No 2 faint.
4th " No 3 good

40 Bot
1st on 3rd row 3888. Borohydrofluoride as UCo_3

217 Bot Top Nothing

109 Top. Nothing
109 Bot No 2 on 2nd row
30055 Uranic Sulfate.

Investigate

138 Top
May be Spot No 1 on 1st row.
138 Bot.
5th on 2nd row weak hard to see
32157 2 gr SrBr + 2 gr UsO4 -

Slides 68 + 69 - Transposed
investigate

69 - Bot.

6 on 1st row	1053	Nitrate aq
2 on "	1051	Pb oxalate Toluen ?
3 on "	1050	Dry Sleorate Al.
4 on "	1048	Cu Palmitate
5 " "	1047	Cd "
6 " "	1046	Mg Tartrate
7 " "	1045	Ferri et Mtg
8 " "	1044	Mg Palmitate,
	1055	Na Salicylate
	1054	Zn Cy
	1116 X	Na Glessotinic

5

put in chemicals –

68.s, Top
1 on 1st row
2 1st row
3 "
4 "
5 "
6 "
1 on 2nd row,

Note

Note
Investigate

45 Top
Nothing
45 Bot No 2 on 5th row black spot faint.
4791 Cy Thoria & Ammonia Cyanide ?

191 Top
No 3 on 1st row black spot
35348 2 gr $NaWO_4$ & 1 mlg $CaPhoo$
191 Bottom No 4 on 1st row spot black
Examine again see if it aint No 3 on 1st row.

Immunizatn.

25 Bot
No 8 on 3rd 4 5 + 6th row bleachers
25 Top 4th on 3rd row may be spot,

149 Bot.
3rd 4th on 2nd row may be blackspots
33241 2 gr KI + 25 mlg Baff,
33240 " + 9 " "
149 Top nothing.

33 Top No 6 6th row.
7702 Monochloroacetic a + Na_2CO_3 + Ur Na
33 Bot ditto,

5 Top

4 on 5 row very faint 6439 Ur + Sn Sulfates
5 on 5th row strong 6440 " + Zn "
4 on 4th row strong 6425 " + Ca "
5 on " stronger 6423 " + Nd4 "
5 on 3rd row strong 6433 " + Pb "
think 7 on 3rd row is black spot. Amm Oxal + Ur Oxal
7 on 4th " " $UrSO_4 + CoSO_4$.
There may be others.
6522 is a bleacher Quinine + Na Sulfates
6445 " Chloride Uran + Ba, S. S.

Note boys mistake

137 Top
Plate too dense.
137 Bot.
No 5 on 6th row strong
7 on 6 " "
32385 - 2 gr Na Phos & 25 mlg Zn Cy, S
32361 2 gr KI + 2 gr Uranic Sulfate.

Note 32385 in Hetherington's book is
2 gr Sr I + 2 grs Uran Sulfate.
& 32361 is 2 gr KBr & 2 gr Ur Sulf.

136 Bot & Top
Nothing

88 Bot
No 1 on 6th row very darkening
2567 - Sulphanilic a + $UO_2(NO_3)_3$ -
88 Top Nothing.

249 Bot + Top
6 on 3rd Row.
37033 2 gr K Borate + 2 gr $Ur SO_4$

87 Top
7 on 3rd row strong
2543 X acid Sulfocarbolic + Nit Uran
Bot - 7 on 3rd + 3 on 2nd row may be spot
2553 - Acid Sulphanilic + $Mg CO_3$?

Note,

Put B at plate, on

21 Tap

No1 on 4th row may be spot

3 on 3rd " "

4 on 3rd " "

3 on 4th " "

2 on 5 " " 6

but all doubtful.

5510 Borotungstate Ba + Carb K + Ba

5463 Phos A + HgO + Carb Tin.

5461 " " + Carb Cd

5508 Borotungstic A + Carb K + NH4

5501 " + Carb Bismuth.

237 Top
8 on 1st row very black
3 on 2nd row
4 on "
2 on 3rd row
3 on "

8 21192 Uran Sulf
3 21189 Ag "
4 21188 Mn "
2 21182 Ag F
3 21181 Ca fl.

Bot
8 on 1st row good
4 on 2nd " looks like one. Mn Sulfate?

Note,

55 Top
5 on 2nd row good
8725 Para Toluidin Sulf + $UrSO_4$
55 Bottom
Weak blackspot 5 on 2nd row.
1 2 3 4 + 5 Top row bleacher.
6 on 2nd row " with blackewash.
8725
8719 Para Toluidin Sulfate + $CdSO_4$
8691 " Nitrate + $Pb\ NO_3$
8716 " Sulf + Pb Sul
8744 Xylidin hydrochl + Ca Chloride
8748 " + Ca Chloride.

245 Top + Bot
Nothing

104 Bot
6 on 1st row spots
7 on 2nd row. "
8 on 3rd row. "
} nothing
3 on 2nd row
2 on 3rd "
1 on 4th row. may be spots. plate too dark.

30489 - 2 gr Ag Cl. 2 gr Ur SO4
30472 " Ca Cl "
30460 " Co Cl "

30535 2 gr Ad Cl + 25 mg Ca Cl
30497 " Hg Cl 3 mg Ur SO4
30598 " Ca Cl 1 mg Sulphur
double

104 Top
6th on 1st

Note,

140 Top
5 on 3rd row may be a spot,
Bottom 140 All Rings

52 Bot
8 on 1st Row weak.
4767 Gluconacy + Ur Cy

Top 52 –
5 on 3rd Black spot weak

244 Bot. Nothing Top ditto

99 Bot Nothing ditto Top.

141 Top Nothing ditto Bot.

24 Bot
6 on 6th row good.
5203 Phos Ac + Carb. Urea.
24 Top do.

Note —

Note —

Note, .

72 Top
7 & 8 1st row bleachers
8 on 2nd " "
8 on 3rd " "
72 Bot 1805 on 5th row may be spot - doubtful

No O Top same but only 3 spots, 7x3
1x2
8x2 -

No O. Bot.
1st on 2nd row
8 on " "
8 on 3rd row } faint spots
7 on 3rd row
No 1 on 4th may be spot.

4281 Pt Cy & Ur Cy
4803 Thoria Cy & Ur Cy
4834 Yttria Cy + "
4863 its on shelf not in book!
4882 Glucina Cy & Didymium Cy

9st Top.

Note, —

145 Bot. plate too dark.

167 Top.
2 on 5th row.
34443 - Agt Ur Sulfates, 2 gr each.
167 Bot.
No 5 on 1st row may be spot has colite hold

86 Bot.
2 on 6th row Bleacher
4 5 + 6 on 6th "
2 on 3rd row "
7 on 4th row very strong ring
86 Top allrings

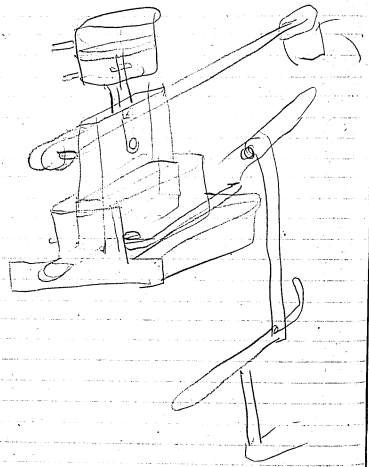
9ft Top –

180 Top
2 on 2nd row very strong ring
180 Bot all rings

238 Bot
No 1 & 2 1st row + 1 & 2 2nd row bleached

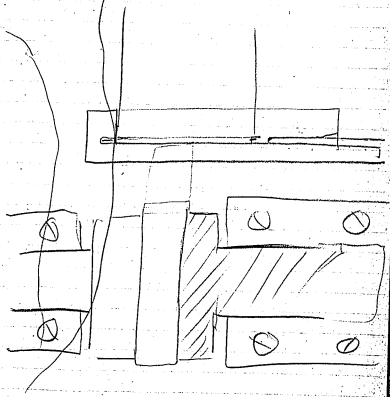
Mch 25 1905 SB

air

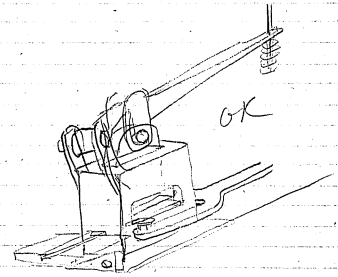


SB

Mch 25 1905

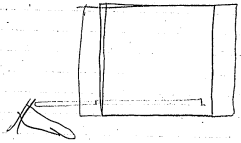


Olmsp B
March 25 1903

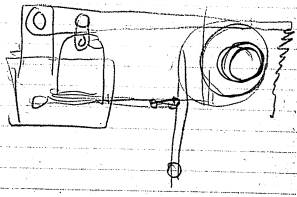


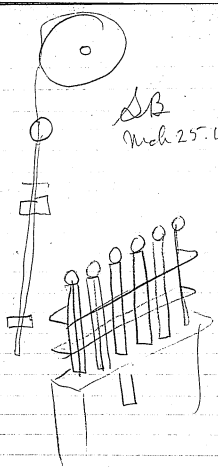
OK

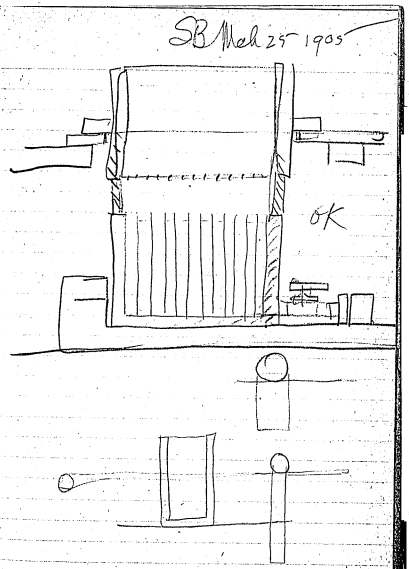
DB
March 25 1903

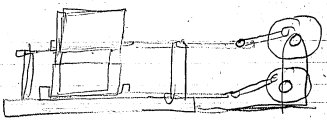


OK

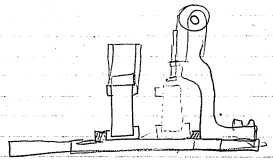



SB
Mch 25. 1905


SB Mch 25 1905
OK

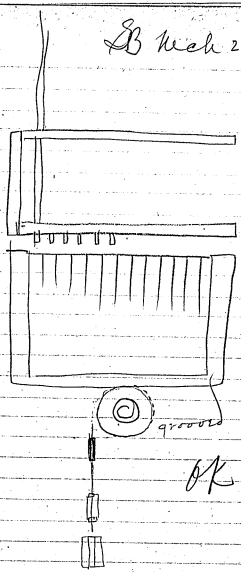


OK



SB Mch 25 1905

SB Mch 25 1905



OK

31 m.

62 inches surface

5) 144 / 29 — 1/10000

400

1" 25/1000

1/40th of inch -

64 inches -

3.5 - 144) 446 (3.1 grms
220
260

40 - 160

120

8 1 1 ft 3 grms -

650) 3000 (4.6
2600
4000

160) 1000000 (6.25
960000
700000
640000
60000

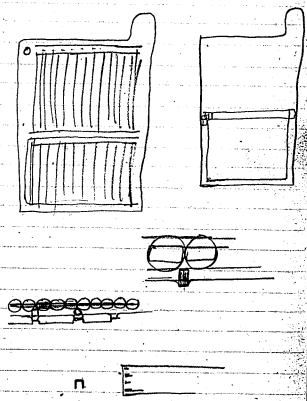
4.6) 144 (31.3
138
60
46
140

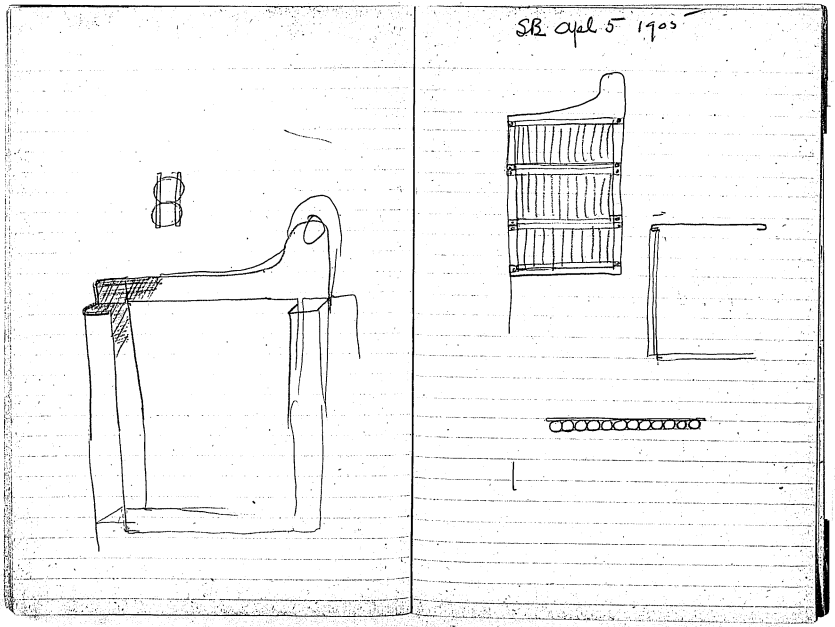
6.25
31
625
625
18750
19375

8 48

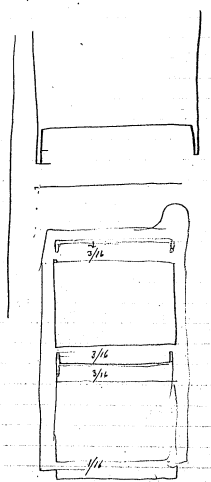
144) 17856 (124
144
3456
288
576
576

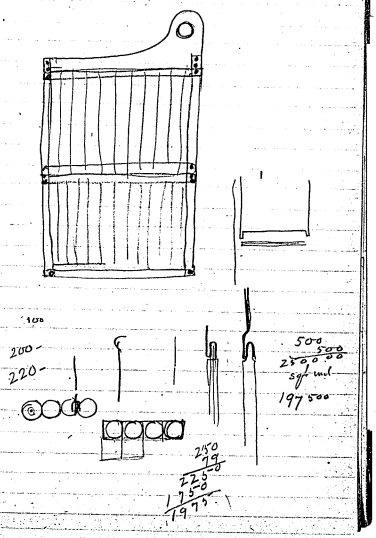
SBat April 5 1905




SB. April 5 1905

SB apl 5 1903


3/16
3/16
3/16
3/16
10/16
5/16


100
200
220
500
500
2500 00
sgl incl
197500
2150
79
2230
1750
1975

102
92
2)194
97

4/4

388000
12
776000
388000
4656000

now 388000

17 of 1/4 inch 839375 –

839375
6
5036250

250
50
90
390

about the same

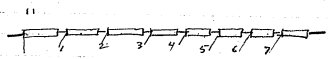
140
18
120
140 –
2570
2340
1800
1560
240

390) 6,46

6

5036250
4656000
380250

7/16 lost.



4" long 97/1000 thick

97
4000
388000 sqr mills –

16) 1000 (62
96
40
7
434

4'434/1000

250) 4434 (17.7
250
1934
1750
1840
1750

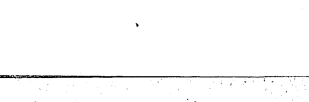
17 0 1/4 –

250
250
1250
500
6250
6250
5625
4375
4375
9375

49375 –
17
345625
49375
839375

2/97
485.

250
3
750



7500 Pulley 1/1000
7200 next
6900 "
6600 "
6300 "

35

240
3
72

230
3
69

49.370.

220
3
66

210
3
63

170
3
51

93

800) 3200 (40

160
3
48

97
5000
485.50

190
3
57

150
3
45

3.9
2.3
195
78
97

32/800 (25
64.0
160
160

150
3
54

40/3900 (975
3600
3000
2500
2500

7500
7200
6900
6600
6300
6000
5700
5400
5100
4800
4500
4200
3900
3600
3300
3000
2700
2400
2100
1800
1500
1200
900
600
300

34500

2

27000

19000

17000

12000

6300

4500

140
3
420

130
3
390

120
3
360

110
3
330

90

34500
27000
61500

500
2500
125000

270.0.

19000
12000
4500
35500

5000

34500

4500

5000

12000

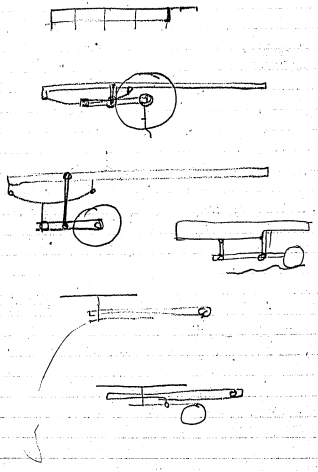
R — 25/1000 in 34800 - 5gr mills of tariff
flat 12000

R 50/1000 in 61500 — 35000 beyond
flat 24000

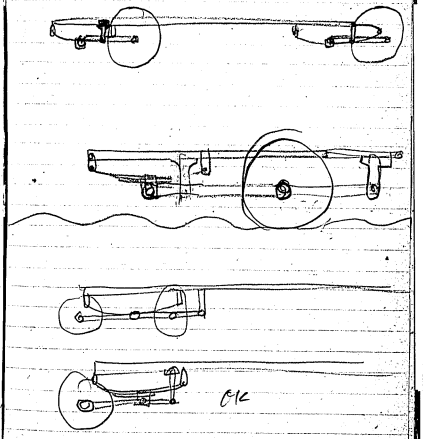
R - 100/1000 in

April 6th 1905

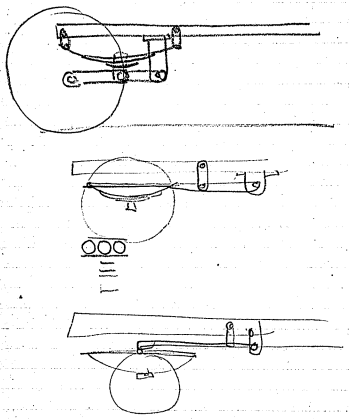
Phono suspension for Automobile



Ditto



Phonodisc for auto April 6 1905

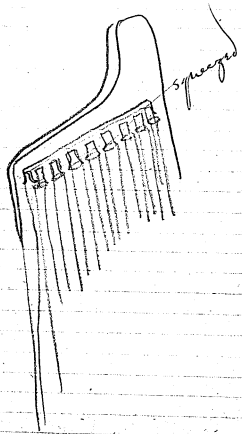


April 7 1905 SBA

Made mould today + cast 1/4 rods of Phono record wax by chilling – Rods 4½" long Coated them with graphite + kneaded fine holes in order to displacing the graphite – plated a tube of Ni Co alloy 2½/1000 thick on wax out by chilling – This is going to be a great success. the $Ni(OH)_2$ with flake Co Ni alloy being packed by hand in the tube – the ends closed like paint tubes + assembled

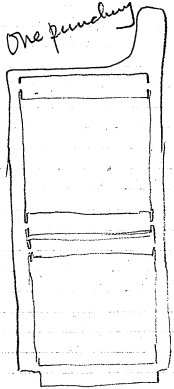
I propose making grid this time but if it makes small one + its OK –

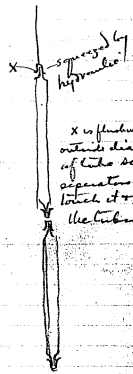
April 7 1905 SB

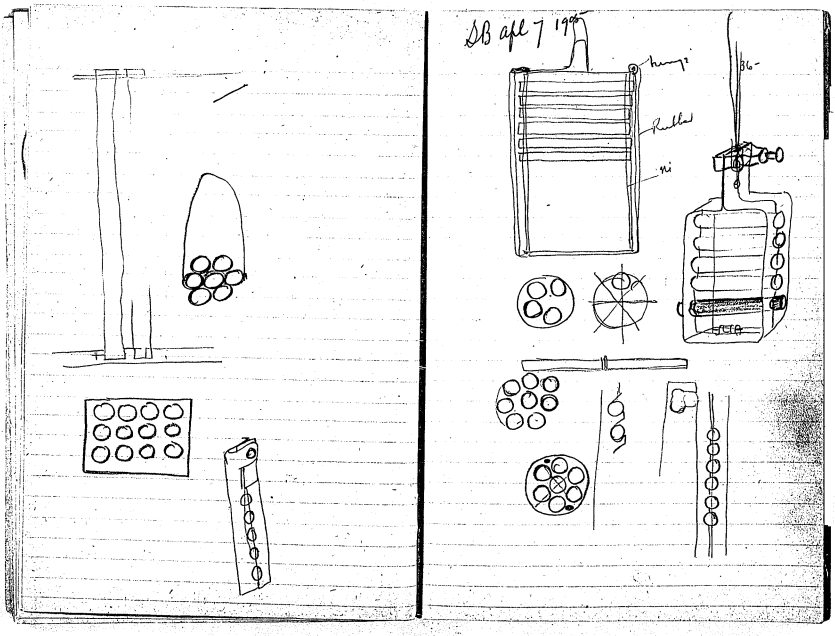


April 7 1905 SB

One punching






DB apl 7 1970

36
80
2880

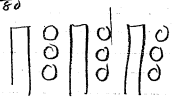
6/80
13 Cells

3/4 - 60

1/2

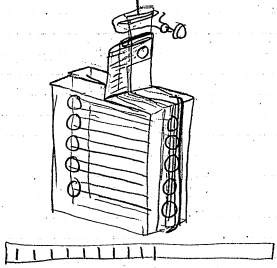
200

3/240
80



AB - Apl. 7 1905

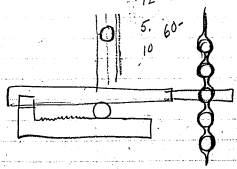
plating Rack -



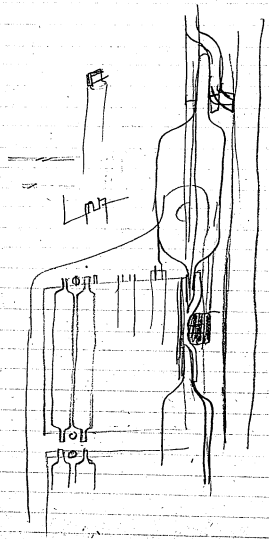
12 3

5. 60-

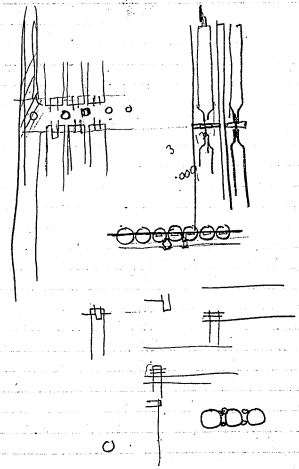
10



SB april 7 1905



SB apl 7 1905



April 7 1905 SB

polished nickel rod
coated by a tooth cavity
material holes - then
with shellac or any water
insoluble material -
Then plated with Zinc -
over this a plate of 1/4 iron
Ni Co alloy then 2 1/4 iron
Ag Nickel
the whole put in acid
Zinc dissolved out
through the holes
leaving hollow rod
Y100

Probably the Ni rod embosses the holes inserted in or then filled flush with the surface of an insoluble compound, that will be permanent

Impregnated Rosin -
Shellac + amylol

	Tool Room	Engine	Store Room	Office & Drafting	Filling Valves	Welding Valves	Mixing	150 Men
	30	25	50	25	50	25	25	150

3rd

Stamp Room	Office & Drafting	Filling & handle from Cupol	Moulding Cupola	Grow Cupola Work	Shop Analysis	Pattern	Shop Planing	General Fitting
	25	50	25	25	25	30	100	150

2nd

Shop Boy	Shop	Bolting Stoning	Testing	Annealing Washing	Welding Electric	Tool Grinding	Screw Machine repairs	Punch Cam Shop Repairs
50	75	50	25	25	25	20	60	75

1st floor

1st	2	3
75	100	150
50	130	100
50	50	75
45	70	55
60	350	380
75	25	
355	375	
50		
405		

May 7 1905 SB

Continue, indefinitely –

The Co is not to consolidate with any other Co, to buy any other battery or Co or engage in any other business without the Consent of the Licensor

Neither shall is use earnings for expansion of the factory beyond fixed capital, ~~unless~~ ~~the same Consent of~~ or cause commitments to be made beyond the Capacity of the Co to meet from its Cash capital,

3 fifths of the directors of the Co shall be nominated by the Licensor,

Herman Edison Battery Co

Capital $500,000.

All of the Capital to be subscribed for in Cash at par or to be paid in by Cells as fast as the requisite for Equipping the factory, require –

Edison is to give the sole license for the German Empire for all his Battery patents during their life and his improvements therein made within eight years from the starting of the factory.

for this the Co enters into a contract to pay a royalty of 60 cents per cell of 18 plates during the life of any of the patents, and one half of the net earnings after 6 per cent has been deducted therefrom + paid to the Cash actually paid in –

After the Expiration of the last patents the royalty shall cease but the half of the net earnings shall

~~International~~

Edison European Battery Co —
Capital, ——

International Edison Battery Co
Capital, $1,000,000 —

This company is organized to own all of the patents of Edison ~~for~~ on the Alkaline Metallic Storage Battery — and to sell ~~or~~ contract with foreign Cos organized for mfg the Edison Battery, for the right to mfr + sell the battery

500000 Cash

Contract with Inventor to pay 60% Roy
+ ½ the profit after 6% on Cash
Capital C –

300 daily – $2 profit – 600 daily
Regularly 150
720 Net,

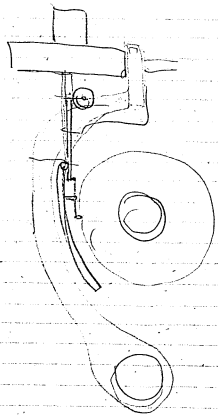
312
47
624
1248
131000

131000 – 6% on 500000 – 30000
30000
101000 –

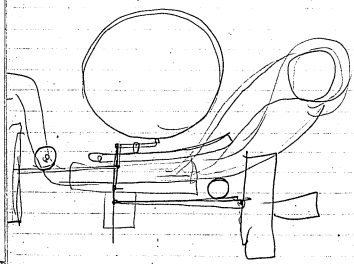
To inventor 50500 – to Cash 50500,
Cash gets 16% div – 30300
505000 –
after patent (approx) 3 cy expense but 1/2 profits Cash Inv.

50500
56160 to inventor. – if the earnings are such
106660 that 6% are earned in the Cash
more capital is required the Capital
is to be increased small for Cash pay
to as to my to full extent of demand

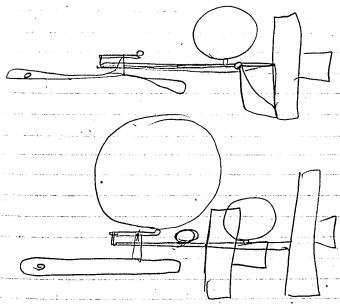
Phono Jan 28 1907



Jun 28 1905 phone



June 28 1905 phone



34
3
3)1020
3480
3960
1920
272
2240
1360
1680
2640
2720
1360
4160

2 Mn-
of
Mg

125.
5.0 | 2800
2250
5250
5250
3,75

Anode

MnO
$KMnO_2$

C

K
$KMnO_4$

7 H_2SO_4

7e SO_3
7 7e

Notebook, N-03-12-29

This notebook covers the periods December 1903 and May 1905. All entries are by Edison. The entries from 1903 relate to x-ray experiments. The enumerated experiments, slides 1-253 and 381-388, are a continuation of those found in N-03-12-12.2. Several entries contain references to a "big book" into which some of the notes were copied. The notes and drawings from 1905 pertain to storage batteries. Included are calculations regarding the performance of a Lansden "Tonneau" automobile. There are also a few scattered phonograph drawings. The front cover is labeled "x ray." The pages are unnumbered. Approximately 170 pages have been used.

Pages containing only slide numbers, with no data recorded, have not been selected.

Dec 29 1903 –
Experiments with 45 hole slides by photographing self radiations through black paper.

No O
Spot 4281 – Cyanide Plat + Cy Uranium
4803 " Thoria + "
4834 " Yttrium + "
4863 not in little book
4882 Cyanide Glucina + Cyanide Didymium

Slide No One

Slide No 2 1st
All rings most dark centers,

Slide 3

Slide 4 – 1st
6389 Amrlin Sulfate + Uranic Sulphate,
very black ring on outside row.

Slide 5 1st

6439 weak Uranic Sulphate + Tin Sulphate
6440 Strong " + Zinc "
6425 fairly strong " + Calcium "
6423 Stronger " + Ammonia "
6433 Pretty Strong " + Lead "
6522 Bleached Quinine Sulp + Na_2SO_4 -
6445 " Uran Chloride + $BaCl_2$

Slide 6

Slide 7 1st
Strong rings

Slide 8 1st
Off rings

Slide 9

Slide 10 1st
Rings, too dark, badly developed.

Slide 11 1st Bad rings
Second Taking —
6 on 6th row strong — Boric at Carbs Uran + Ba

Slide 12 1st
Rings —

Slide 13.
Too dark to see.
2nd taking 96 Hours
3 on 1st row strong 4286 Urea
1 on 5 " " 4329 "
3 on 6 " weak 4266 "

Slide 14 – 1st
3 on 2nd row } Doubtful
6 on 4th row }
3 on 4 row 4374 – $Sr(NO_3)$ $Bi(NO_3)$
4373 $Ca(NO_3)$ $Ag(NO_3)$

Slide 15 1st
All rings — Phenom. where gelatin torn off spot or rather ring is on glass just as strong & dont scratch off — investigate, ?

Slide 16 1st
Rings

Slide 17 1st.
Nothing on plate,

Plate 18 1st
3 on 2nd row on both top + bottom plates
shews edge of brass ring full size, and
intensely black, on both
7075 Borofluoric acid, + $(NH_4)_2CO_3$ + PbO.
Slide 18 2nd Nothing —

9th reading forgot it

Slide 19 1st.
Mostly rings seems to be one or Two spots.
2nd taking 96 hours.
← 5 on 1st row strong

Slide 20 1st
Nothing -

Slide 21 1st
Strong rings
No 1 on 4th row may be spot.
3 on 3rd " "
4 on 3rd " "
2 on 5th " "
5510 Borolungstate Ba + Carbo K + Ba
5463 Phos a Hg O + Carb ~~[illegible]~~ Tin
5461 " " + Cd CO_3
5508 Borolungstic a + Carbo K + Nthy
5501 " + " Bismuth.
All doubtful

2nd Taking 96 hours
5 on 5th Row | 5498 Borolungstic a + Uran CO_3
1 on 3rd Row Phos Acid Pb O + Nickel CO_3 ?

S

Slide 22 1st
Rings - cant Tell —

Slide 23 1st
Think there are spots - rs lake,
Slide 23 2nd nothing

Slide 24 1st
6 on 6th row-black strong-
5203 - Phos acid + Carb Uranium

Slide 25 1st
8 on 3rd 4th 5th + 6th rows bleachers
4th on 3rd row may be a spot
A large black area, double size of a spot
Plate too dark to tell much
2nd taking 96 hours
1 on 4th row weak 5309
Phos acid + Carb of Barium + Cobalt.
2 on 4th row very strong 5248
Phos a + Carb K + Uran
5309 adjoin + may be dirt from 5248

Slide 26 1st
Lots of Bleachers 1 2 3 4 5 on 6th row
ditto 1 4 2 on 2nd row.
May 62 one spot —

Slide 27 1st
All rings —

Slide 28 1st
Rings + spots
Slide 28 2nd Taking
7505 Sulphovinic ac + Uranate Nitty
7605 Sulphopseudocumol + "

Slide 29 1st
7 on 3rd row
7530 - Methylsulphonic ac + Uranate Na —

?

Slide 30 1st

7 on 4th row 4123 = Permolybdic NO_3 + Uran NO_3
2 on 5th " 4336 $NaNO_3$ Uran NO_3 " "
6 on 5th " 4301 $NaNO_3$ $SrNO_3$ " "

Slide 31

Slide 32 1st
Rings

Slide 33 1st 6 on 6th row
7702 Monochloroacetic a + Na_2CO_3 + Br Na

S

Slide 34 1st
Developing note – one black spot 4th or 3rd row
next to end one, sure, not strong

Slide 35 1st

Slide 37 96 Hours 2nd taking
4 on 4th row CyK+ Li Cl— think 9 record
spots wrong see plate 4 on 3rd to Uran
look it up = later its right on plate
big book —

Slide 40

Slide 41
3 on 1st row strong 3773 Urean
2 on 3rd " " 3842 "

Slide 42

Slide 43 2nd Taking 96 hours
1 on 6 Rows strong 7771 Uranic salt

§

Slide 44 96 Hours
5 on 5th row strong 8221 Urau
4 on 4 " weak 8090 "
5 on 2nd " 8244 "
6 on 2nd very very weak 8243 "
O-Tolidin soy $NaClO_3$ + $Zr(OH)$

Slide 45

Slide 54

Slide 55 - taken with piece of salicylate strontium gives a white spot which is Sulphate Urea & Barium - spot perfect + white +

S.

S.

S.

Slide 56 2nd taking 96 hours

8 on 2nd row Uran fair

8 on 6 " para Iodin Nitrate & Hg O weak nitrate S.

2 on 4 " Uran strong

4 on 6 " Uran faintly shining

7 on 6 Para Iodin Nitrate & Sb Nit in by book

but Pb. Nitrate in little book

3 on 1st row may be spot

O-Iodin SO_4 & $Sb\,SO_4$ -

Slide 57

Read off wrong slide

6.6.6.6.

Correct reading

63 2nd Taking 96 hour

~~1 on 5 5th row strong 5436 Phos A + Mn + Hg Carbonates~~
5 on 5 " " 7024 Borolinophosphate A + K + Sr "
3 on 6 " weaker 7037 " + K_2CO_3 + MgO
5 on 6 " fairly strong 7060 " + NH4 + Ba Carbonates
7 on 6 " Very strong 7070 " + NH4 + Fe Carbonates
~~2 on 1st strong 5376 Phos A + Al + Zn "~~
ok for big books

1 on 5 row strong 2969 oxalate of UO_3 K_2CO_3 + Al_2Cl_6
5 on 5 " 2994 " + $ZnCO_3$ or UO_3
3 on 6 weaker 2956 " " UO_3 + K_2CO_3 + $MgCl_2$
5 on 6 fairly strong 826 Uran
7 on 6 very strong 990 Opalish Cu + Uran
2 on 1 strong 2922 " acid + UO_3 + K_2CO_3 + $CuCl$

okay by book $

74 2nd Taking 96 hours
1 on 5th row strong 1461 Uran
3 on 5th " weak 1464 Iodide K + Nd 4 Iodide $
3 on 6th " " 4260 Uran

75

78 2nd taking 96 hours
4 on 6th row · very weak KCy + UCl – 1696

79

94 2nd Taking 96 hours
4 on 2nd row varying 8963 Xylidine Urea Oxalate

95

?

104 2nd Taking 96 hours
6 on 1st row 30489 Urea 2 gr
7 on 2nd 30472 " "
8 on 3rd 30460 " "
3 on 3rd week 30499 " 50 mlg
6 on 6th very weak 30499 " 25 mlg
7 on 1st very weak may be a ring
30592 2 gr CdCl + 1 mlg Sulphur

105

124 - 2nd taking 96 hours
Nothing

125

126

127 - 2nd 96 hours -
Retake 144 hours

130 2nd Taking 96 hours
4 on 5th row very very weak
25 mlg Uran SO4

131

132 2nd taking 96 hours
1 on 4th row weak 31976 50 mlg Urea SO4
3 on 4th very strong 31977 2 gr "

133 2nd taking 96 hours
2 on 5th row very very weak
32059 25 mlg Urea

135 2nd Tinking 96 hours

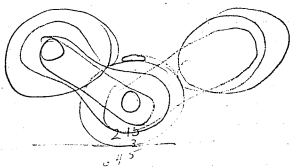
1 on 4th row very strong	32229	2 gr Urean
2 on 4 " "	32280	"
3 on 4 " "	32313	"
8 on 3rd " "	32265	"

140 2nd taking 96 hours
Nothing

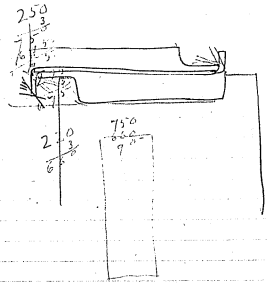
141

154 2nd 96 hours
Nothing

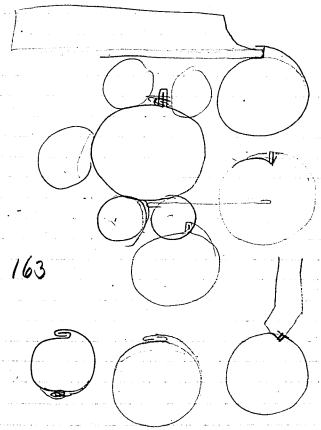
155



105.

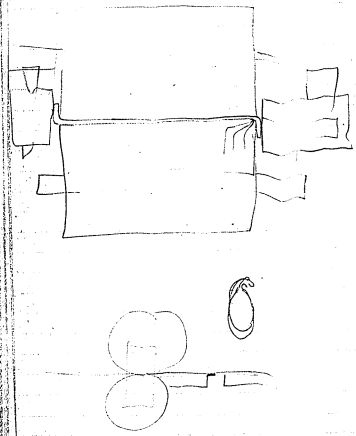


162 May 7 1905 SB



163

May 7. 1905 SB



164

165

§

180 2nd baking 96 hours
2 on 6 throw-employing work 34681
K Arsenate + 25 mlg Ca Borate ok by bonb

181

210 2nd looking 96 Hours
5 on 2nd row very very weak 36425
2 grms Cu Arsenate & 25 Mily Uran Sulfate

211

224 2nd Taking 96 hours
Nothing

225

228

229 2nd taking 96 hours
Nothing

244

245 2nd Taking 96 hours
Nothing

c

26 miles hour

154
54
616

770
831 6 watts. wt 4760 – lb

2000 | 4760 (2.38
4000
7600
7600

238 | 831600 (3499.4
714
1172
952
2240
2142
980

238
26
1428
476
6188 ton miles –

6188 | 83160 (134
61880
21280
18564
2716

134 Watt per ton mile –

221
536
2688
321
26
1926
642
834

21 miles – 121 Watts per ton mile

1115
48
8920
4460
53520 watts.

2.1 tons.
21 miles
21
42
441

2000 | 4200 (2.1
4000
2000

441 | 53520 (121
441
9422
8820
6000

135 Watts per ton mile 25 miles per hour
is pretty sure a can be battered -

Weight of Tonneau 3200 lbs
with 60 & 27 - + 4 persons 4000 lbs

Assuming E. 27 new to give 300 amp h
120 V.

300
120
600
360 watt hours

360
60
2160 watt

of assuming wt. to be 2 ton -

3200
700
3900 -

+ 25 miles hour would be 50 ton
miles - per hour -

135
58 - watts to go 25 miles
6750

533
25
2660
1068
13325

270 ~~36000 (133~~
~~270~~
~~900~~
~~810~~
~~90~~

~~This will take the Lambert Tonneau 135 miles at 25 miles per hour with 4 people on it!~~

3. 360
60
67.50) 2160 (3.2 - hours
2025
1350
1350

3.2
25
160
64
80.

5/80
10.

This will drive the Lambert Tonneau
80 miles — at 25 mile rate 4 persons

1115 -
48
5920
4460
5352 - watts

5352) 21600 (4.03
21408
192

21
4
84 -

84 miles at 21 mile Rate

21600
1800
23400
21440
19600
16200
3216
360
1800

5360 | 4.36

120
400
480

17
5
85

588
211
588
588
1176
6

360
100
36
144

436
21

12200

450
267
47888
42888
4588
45
270
270
3

5.88

3 | 835
279
111
3

436
211
436
436
8722
91.99

5352 | 31560
92

1.92
26
2840
2840
1520
1440
80

70 cc

15
66
90
90
9

180

284 | 3000
2841
1590
1420
170

1775
1223

284 | 2000
576

1113
192
276
276
1003.9
1113.6

213
709
3.09

2848
2
2848
2848
3.6

381 Rafin 96 hours
Nothing

382

383 Rafn 96 hours
8 on 6th row fairly black 145 Pitchblende
6 on 6 " Black 147 Uran-Carnotite
2 on 3 " very black 175 Samarskite
1 on 6 " very weak 152 Monazite sand
8 on 2 " 177 Columbite
3 on 1st - weaker yet 190 Tin Chloride A
4 on 1st still weaker 189 Tin Chloride B -

384 96 hours -
Nothing

385 Rafn 96 hours
Nothing

386 Rafn 96 hours
Nothing

387 Rafw 96 hours
3 on 5th row doubtful —
~~Number called up~~
9 ravel — Vermillion,

388 96 hours
Nothing.

[ITEM FOUND IN BOOK]

		Miles-	
154—	54—	26-	4760,
111.5	— 48 —	21.7	4200-

[ITEM FOUND IN BOOK]

1 — 45 - 54 - 76

2 84 -

4 22 - 65 - 50

5 32 - 33 - 75

7 51 - 61

8 48 - 66

10 108 - 143

11 68 - 58 - 47

12 99 144

13 104 105

14 110

15 92 - 94 - 67

16 142 - 89

17 - 114

18 110

19 - 105 - 144 - 104 - 63

[ITEM FOUND IN BOOK]

20 64
21 77 - 37
22 141 - 55
23 72 - 51 - 56
24 76 - 44 - 45
25 100 - 101 - 80 - 57 - 29
26 66 - 53 - 58
27 71
28 144 - 101 - 97
29 111
30 112
32 61
33 77 - 30 - 36
34 86 - 72
35 110
36 67 - 58
37 108 - 105 - 143
38 108 - 109 - 143
39 55 - 62 - 83
40 24 - 25
41 115
42 58 - 68
43 62 - 48
44 108 - 143
45 28 - 30 - 79
46 62
47 63 - 90
48 147
49 99 - 103 - 144
50 114
51 112
52 42 - 77
53 18 - 52 - 74
54 108 - 143
55 37 - 81

[ITEM FOUND IN BOOK]

57 64
58 — 83 — 22
59 — 23 — 25
60 — 143 — 98 — 103
61 109
62 79 — 54 — 57
63 88 — 62
64 — 72 — 56
65 84 —
66 — 116
67 — 113
68 92 — 74 — 61
69 76 — 27 — 31
70 — 69 —
—
72 — 77 — 49 — 45
73 103 — 97 — 147
74 — 106 — 93 — 86 — 146
75 110
76 65
77 — 89 — 90 — 65
78 — 144 — 105 — 104
79 90 — 93
80 — 95 — 147 — 101
81 — 112 — 93 — 95 — 68
82 87 — 142
83 89 — 23
84 86 — 87 — 141
85 91 — 149
86 67 — 46
87 79 — 36 — 38
88 81 — 50 — 35
89 95 — 149 — 94

[ITEM FOUND IN BOOK]

90 – 147 – 102
91 84

93 — 104 – 105 – 143
94 146 – 104 – 106
95 104 – 145
96 — 54 – 72
97 — 65 – 84
98 — 99 – 144
99 43 – 44 – 80

100 —
101 — 107 – 145
102 70
103 — 102 – 147
104 80 – 40 – 44
105 — 142 – 148
106 108 – 146
107 — 18 – 21
108 2 – 16

109 85 – 22 – 26
110 — 92 – 148
111 — 115 —
112 89 – 22 – 25
113 82 – 63
114 — 2 – 13 – 11
115 96 – 97 – 149
116 — 107 – 108 – 146
117 — 19 – 20
118 19 – 21
119 — 93 – 145
120 — 95 – 97 – 145

[ITEM FOUND IN BOOK]

121 — 19-21
122 — 19
123 — 20
124 — 146-94-106-19
125 — 95-102
126 — 18-21
127 — 53-116
128 — 16-18

131 — 143-106
132 — 88-141-88
133 — 149-96-97
134 — 64-87-89-142
135 — 96
136 — 34-81
137 — 34-46-81
138 — 26-90
139 — 84-89-142
140 — 41-80
141 — 44-49-81
142 — 149-101

144 — 148
145 — 27-46-75
146 — 55-67
147 — 57-103-66

149 — 27-52-77

[ITEM FOUND IN BOOK]

151 — 88 — 50
152 — 115
153 — 100 — 147
154 — 141 — 85
155 — 114
156 — 114

158 — 9 — 16
159 — 7
160 — 7
161 — 71
162 — 26 — 23
163 — 100 — 149

165 — 11 — 13
166 — 9 —
167 — 62 — 46 — 48 —
168 — 73 — 52 — 55
169 — 83 — 68
170 — 144 — 98 — 103
171 — 69
172 — 52 — 53 — 22

174 — 86 — 73
175 — 86 — 71 — 55
176 — 3 — 14
177 — 69
178 — 85 — 69
179 — 57 — 47 — 114 — 66 — 105

[ITEM FOUND IN BOOK]

181

183 — 91-93-62
184 61-94
185 — 69-85
186 150-91-92

188 69

190 — 100-103-143
191 28-55-44
192 58-67
193 — 93-142-
194 — 114
195 — 147-94

197 — 148-91-102
198 — 147-145-101-102-107
199 — 145-104-109
200 — 111
201 — 106-145

202 143-104
203 111
204 98-103-148
205 — 107-146
206 143-98-99
207 102-147
208 113

[ITEM FOUND IN BOOK]

210 — 113
211 — 148 — 102
212 — 70
213 — 53 — 71
214 — 10
215 — 54 - 55 — 75
216 — 20 - 21
217 — 26 - 26
218 — 110
219 — 5 — 4
220 — 6 — 15
221 — 11 — 12

223 — 2 — 14 — 17
224 — 92 — 101 —
225 — 5 — 15 — 20
226 — 12
227 — 83
228 — 63
229 — 96 — 100 —
230 — 61 — 90 — 94
231 — 3 — 11 — 13
232 — 2 — 9
233 — 4 — 14
234 — 5 — 3 — 20
235 — 105 — 144 —
236 — 22 — 23 — 26

[ITEM FOUND IN BOOK]

238 — 111 — 66 — 47

240. 73 — 52 — 53

241 — 141 — 84 — 87

242 145

243 — 83 — 71

244 — 80 — 43

245 — 40 — 43

246 — 95 — 149

247 — 143 — 98

248 113

249 — 81 — 49 — 35

250 — 114

251 143

252 113

253 109 — 6 — 17

254 2 — 17

256 — 83 — 70 — 51 — 56

257 70 — 53 — 56

258 — 8

260 — 7 — 8

261 — 63 — 59

262 — 64 — 57

263 — 63 — 57

264 69

265 71

266 — 64

267 — 9 — 10

380R
382R

[ITEM FOUND IN BOOK]

53 14

111 2
108 2
176 3
160 7
159 7
166 7
159 7
166 7
165 11
119 11
114 13
165 11
176 14
125 16
152 16
109 16
121 16
147 16
126 15
125 15
121 14
154 14
117 19
125 19
125 20
117 20
116 21
121 21
126 21
159 21

234 3
219 5
220 5
219 4
233 4
231 3
234 3
233 2
232 2
254 2
253 6
220 6
260 7
258 8
269 8
267 9
264 10
214 10
231 11
221 11
226 12
224 12
221 13
222 14
213 14
220 13
232
225 17
254 17
253 17
230 20
234 20
216 20
216 21

[ITEM FOUND IN BOOK]

47 63
19 63
54 64
20 64
97 65
76 65
77 65
4 65
56 65
5 66
26 66
86 67
36 67
15 67
51 68
11 68
42 68
70 69
27 71
34 72
96 72
64 72
23 72
53 74
5 75
69 76
9 76

183 62
63
134 64
160 66
147 66
192 67
146 67
169 68
177 69
176 69
171 69
188 69
185 69
102 70
161 71
175 71
174 73
168 73
191 74
145 75

228 63
261 63
263 64
266 64
262 64
236 66
264 69
256 70
212 70
257 70
256 70
243 71
213 71
265 71
240 73
215 75

[ITEM FOUND IN BOOK]

21 77
33 77
52 77
72 77
87 79
62 79
45 79
25 80
99 80
88 81
55 81
58 83
39 83
2 84
65 84
97 84
91 84
22 85
84 86
34 86
34 86
74 86
84 87
82 87
63 88

149 79
140 80
104 80
137 81
141 81
110 81
113 82
169 82
139 84
150 85
185 85
178 85
154 85
109 85
174 86
175 86
150 86
134 87
151 88
132 88

237 79
244 80
249 81
245 83
256 83
227 83
241 84
241 87

[ITEM FOUND IN BOOK]

83	89	112	89	230	90
16	89	134	89	246	91
77	89	139	89	224	92
77	90	135	90		
79	90	183	91	230	94
47	90	186	91	246	95
85	91	199	91	229	96
15	92	110	92		
65	92	186	92		
81	93	183	93		
79	93	119	93		
74	93	119	93		
65	94	193	93		
15	94	129	94		
81	95	184	94		
89	95	125	95		
80	95	135	96		
89	96	115	96		
73	97	133	96		
28	97	133	97		
		115	97		

[ITEM FOUND IN BOOK]

60 98
49 99
12 99
98 99
44 100
54 100
25 100
54 100
37 100
25 101
28 101
80 101
90 102
73 103
49 103
60 103
19 104
93 104
95 104
13 104
78 104
91 104

170 98
120 98
195 98
120 99
153 100
163 100
190 100
198 101
142 101
197 102
125 102
198 102
103 102
170 103
147 103
190 103
199 104

206 98
204 98
247 98
206 99
229 100
224 101
211 102
207 102
204 103
202 104

[ITEM FOUND IN BOOK]

78 105
13 105
19 105
37 105
94 106
74 106
38 108
10 108
93 108
38 109
61 109
14 110
18 110
35 110
75 110
29 111
51 112
81 112
30 112
67 113
17 114
50 114

180 105
131 106
124 106
198 107
101 107
116 107
116 108
106 108
199 109
191 114
155 114
156 114

235 105
201 106
380R 106
205 107
205 107
253 109
209 109
218 110
200 111
203 111
235 111
382R 112
381R 112
248 113
210 113
252 113
208 113
250 114

[ITEM FOUND IN BOOK]

41 115
66 116
22 141
84 141
82 142
46 142
60 143
10 143
38 143
93 143
44 143
37 143
54 143
19 144
47 144
98 144
12 144
28 144
13 144
78 144
95 143

152 115
111 115
127 116
132 141
154 141
139 142
134 142
150 142
105 142
193 142
190 143
170 144

[illegible] 141
206 143
247 143
251 143
202 143
235 144

[ITEM FOUND IN BOOK]

72 49
88 50
56 50
4 50
56 51
7 51
23 51
25 51
53 52
96 54
62 54
0 54
39 55
23 56
64 56
64 56
62 57
26 58
36 58
42 58
26 58
11 58
68 61
32 61
7 61
46 62
43 62
89 62
65 62

141 49
151 50
149 52
172 52
168 52
192 53
127 53
191 55
168 55
146 55
175 55
180 57
147 57
192 58
134 61
167 62

249 49
256 51
240 52
215 53
257 53
215 54
215 55
240 56
257 56
256 56
263 57
263 57
263 57
262 57
261 59
230 61

[ITEM FOUND IN BOOK]

4 22
58 22
83 23
59 23
40 24
59 25
40 25
69 27
45 28
25 29
33 30
45 30
69 31
5 32
25 33
23 34
23 36
87 36
21 37
87 38
5 39
52 42
99 43
99 44
24 44
24 45
72 45
0 45
86 46
11 47
8 48
43 48

109 22
172 22
112 22
162 23
112 23
169 26
162 26
135 26
145 27
191 26
149 27
139 34
136 34
104 40
140 41
140 41
109 44
141 44
145 46
137 46
167 46
180 47
167 48

236 22
236 23
217 26
236 26
217 26
249 35
237 36
237 36
242 40
244 43
245 43
238 44

[ITEM FOUND IN BOOK]

94 146
74 146
73 147
90 147
48 147
80 147
85 149
89 149

131 145
160 145
199 145
101 145
198 145
119 145
120 145
106 146
124 146
116 146
195 147
103 147
153 147
196 147
197 148
110 148
144 148
105 148
133 149
115 149
192 149
163 149
186 150

242 145
201 145
205 146
380R 146
207 147
204 148
211 148
246 149

[ITEM FOUND IN BOOK]

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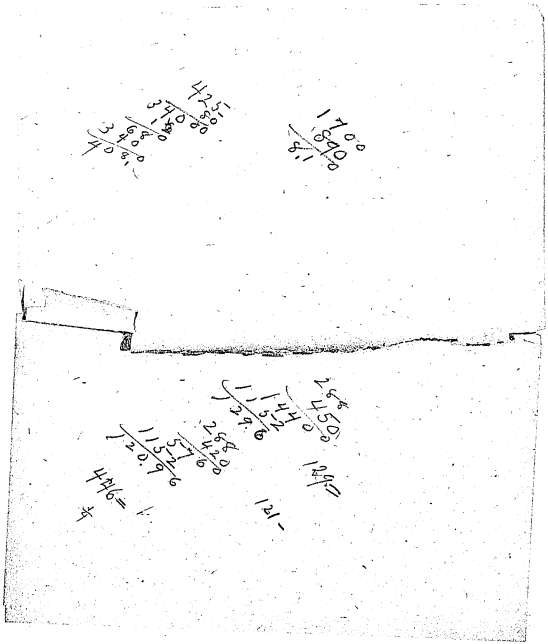


Notebook, N-03-00-00.3

This notebook covers the period 1903-1904. The book contains notes, primarily by Edison, regarding experiments to stop the action of the potassium hydroxide solution on the components of Edison's storage battery. Included is a list, drawn from chemical reference texts, of compounds that are not acted upon by alkaline solutions. The inside front cover is inscribed "1903-04 Experiments on Foaming of KOH in Battery Witness Ludwig F. Ott." An entry on the first page indicates that the work was done at Edison's laboratory at Fort Myers, Florida. Inserted into the book is a one-page note regarding tests on the "foaming" of battery solutions. The pages are unnumbered. Approximately 40 pages have been used.

X E-172
N-(03-00-00) T.A.E.

1903-04 Experiments on Foaming of KOH in Battery.

Andrew Lindsay 7/1/04

Substances not altered by alkalis
Abstracted from Watts Dic + RTS works
at Myers fla March 1904

Acridine – a base, not oxdzd or altered by KOH
Aniline black – powerful base, insoluable alkalis

Benzamide } see Watts 2nd Sup 80.
Anisaldehyde }

Anthracene Orange. Unacted upon by KOH.

Anthrachrysone Unacted upon by KOH
see Watts 2nd Sup 86.

Abietin not attackd by KOH.

Monochloroacetal, aromatic odour BP 155 C.
Vapor den 5·38 perfectly neutral not
attackd by KOH.

Dichloroacetal BP 180 aromatic.

Gaseous Hydrojodic acid passed into Acrolein forms substance insoluable acids or alkalis Contains Iodine.

Amarine - solid resin not attack'd by fused KOH -

Amarone not decomp'd by alcoholic KOH a resin -

Oil Anise not attacked by strong boiling solution of KOH.

Oil Anise treated with Antimony trichloride gives Anisoin - fuses 100 C. not attacked by boiling KOH.

Anisol, aromatic odor insol KOH BP 152 C

Nitroanisol aromatic heavier than water BP 260 C. insol H_2O. not attacked by boiling KOH.

Azoxybenzine MP 36 C insoluable KOH.

Benzilin MP 130 C Amorphous not attacked by boiling KOH.

Benzoin MP 120 C not attkd boiling KOH.

Benzoline MP 248 C "

Benzostilbin MP 244 C KOH of spec G 1.20 dont attack it.

Betulin a resin from the outer bark of the Birch Tree MP 200 C. not dissolved by KOH

Cajuputene hydroiodate anhydrous cryst not altered by boiling KOH.

Capnomor Oil BP 200 C insol H_2O or KOH

Cumene C_9H_{12} BP 144 C aromatic odor S.G. 0.87 not attacked by fused KOH

Cumo-salicylous anhydride [see Cuminic anhydride] not attacked by fused KOH.

Cyanzthane MP 190C, solid, not attackd KOH

Cymene Oil, SG 0·87 BP 171 C aromatic not attackd by KOH.

Dammara Resin, non acid part, not attackd by KOH.

Ethylenic Oxide with Aldehyde BP 82 SG at O, lent 1·002 not attackd KOH.

Guaiacine BP 118C SG 0·87 not attackd by KOH.

Helenin – solid – insol H_2O MP 72 BP 275 not attackd by KOH either in H_2O or Alcohol.

Heptyl Chloride SG 0·89 BP 160 C aromatic not attackd by boiling KOH 26·6% Chlorine burns smoky flame

Heptylene Chloride, lighter than H_2O
Aromatic, BP 191 C 42% Cl boiled for some time in alcoholic KOH decompd into HCl & another chlorinated compound.

Hydrobenzoin, solid - not attacked by boiling KOH Even alcoholic -

Hydro cinnamide - solid - not attacked by boiling alcoholic KOH -

Icica Resin - one part not soluable in KOH.

Indigo Blue not soluable in KOH.

Iodoform not sol in H_2O acids or KOH decomposed by boiling KOH.

Marrubiin not attacked by KOH.

Melene - (Paraffine of Wax) not attacked by boiling KOH.

Mesitylene BP 155°C aromatic - light oil
not decomposed by KOH aq

Mesitylene trichloride - solid, not decomp.
by even solid KOH.

Metacetone " "

Chloronaphthalene, oil, not attacked by KOH.

Dibromonaphthalene MP 59 - " "

Hexachloronaphthalene, wax, MP 140°C
Can be bent, rosette cryst, unattacked by KOH.

Octyl Alcohol BP 180. SG 0.82 insol H_2O
Chloride ditto + lighter than H_2O SG 0.89
burns smoky green think not affected
by KOH. both aromatic

Onocerin solid - insol H_2O not attacked KOH

Oxynaphthalamine – amorphous powder insol NH_4 or KOH. insol H_2O $C_{10}H_9NO$ its oxdgd Naphthalamine, it combines with either acids or alkalis.

Palmitone, Ketone of Palmitic acid MP 84 not attacked by KOH.

Anthracene, unaltered by alkalis

Oxanthracene solid resin not attacked by KOH aq

Phenol not attacked by KOH. BP 187. floats on water sparingly sol in H_2O.

Ethylic Phenate (Phenetal) BP 172C aromatic not attacked by KOH.

Bromophenyl. MP 164 insol H_2O not attackd even by alcoholic KOH.

Monobromobenzine not attackd by KOH

Ind. Hrwy

Chloride of Phenyl. BP 138 not attkd by KOH

Phenyl-sulphide-proto. BP 292. aromatic SG 1·09 – insol H_2O not attacked by KOH either in water or alcohol.

Tribromophenylamine Cryst MP 117 BP 300. insol H_2O dont dissolve in acids or alkalis KOH has no action at boiling heat

Cyaniline Cryst. MP 210. Neutral, insol H_2O not affected by boiling solution KOH.

Mononitrophenylamine – action of Bromine is to make a resin not affected by KOH.

Pyrrol red. solid, insol in acids or alkalis

Quinoidine a base got in mfg Quinine Resin – not dissolved by alkalis.

Styrylamine a solid base MP 100 insoluable in KOH.

Phenylsuccinamide, cryst, sublimeable, not attacked by KOH.

Sulphobenzide Cryst MP 128 not soluable in KOH.

OxyThymöil - cryst, aromatic, MP 48 insoluable in KOH.

Chlorotoluene BP 157 C SG 1.08 at 14 C not affected by KOH.

Acenaphthene MP 100 BP 284. not attkd KOH

Methyl-acetal SG 0.85 BP 85 slightly sol H_2O not attacked by KOH.

Anishumin, black mass insol KOH. Alcohol, Ether H_2O or ammonia.

Hydranisoin solid - MP 172 not attacked by KOH aq or Alcoholic.

Anthracene Hydride MP 106 - not attacked by KOH.

Dibromoanthracene Cryst MP 221 not attacked by KOH or alcoholic KOH except at 160 C.

Dichloroanthracene MP 205 C. not attacked by KOH aq -

Tetrachloroanthracene MP 220 " "

Anthraquinone MP 273. not oxidized by strong oxidizers not attacked by alcoholic KOH or even fusion with KOH.

Dinitroanthraquinone - Fritzsches Reagent.

Hexachlorobenzine MP 226 BP 331. difficultly attacked by KOH.

Mon-iodobenzine. Liquid. aromatic, BP 185 SG - 1.69 - not decomposed by solid KOH. or KOH aq or Alcoholic.

Sulphobenzide solid, MP 125 not attacked by alcoholic KOH at 180 C in sealed tubes

Dichlorosulphobenzide oil, heavier than water insol therein faint odor like Camphor, distils 300. not attacked by alcoholic KOH or Sodium amalgm

Toluene in alkaline Potassium permanganate gives benzoic acid and a neutral solid aromatic body insol in H_2O or KOH.

Dibromotoluene MP 107 not attacked by alcoholic KOH or Oxdzd by Bichrom + H_2SO_4

Sulphotoluide MP 155 insol H_2O not attacked by alcoholic KOH.

Tolylbisulphide not attackd by KOH.

Dibromoxylene MP 69 unattackd by Alcohol KOH

Mono bromocumine BP 218 SG 1.32 not attacked by Alcoholic KOH

Monobromomesitylene, oily-aromatic, SG 1.31 at 10 C. BP 225 not attacked KOH amalgam at any Temp

Monobromocamphor, aromatic solid MP 76 C not decomp by Alcoholic KOH

Camphor heated for 3 or 4 hours with Alcoholic KOH converted To soft tough yellow resin which becomes perfectly inodorous by prolonged heating to 100 C.

Monobromocetin lighter than Water not attacked by KOH.

Conferin- by boiling in dilute acids, resin formed insoluable in KOH. Watt 1st Sup 489

Duodecyl chloride- from petroleum duodecyl nearly inodorous. BP 246 SG 0.933 Non action KOH

Ethenyl-diamine- insol KOH. 1st Sup 585

Action Sodium Alcohol + alcoholic KOH on Dichlorinated Ethyl oxide Liquid BP 157 C aromatic heavier than water not attacked by boiling KOH aq 1st Sup 597.

Diethylene Bisulphide slightly sol water MP 110 C sublimes at 56 C BP 200 strong not unpleasant odor not attacked alcoholic KOH.

Grahamite, pitchy fossil mineral found in Ritchie Co Va insol KOH, or Alcohol, partially in Benzol. Wholly in CS + Benzol. softens 200 Carbon 76% H 7% O 13% 13% ash

Phono #

Guanidine 1st Sup. 654 see Melaniline insol in acids or alkalis

Pentabromonaphthalene Cryst, not affected by Alcoholic KOH,

Ditto Pentachloronaphthalene

Cyanonaphthalenes 1st Sup. 847
B-Cyanide forms substance like Stearin MP 65 beautiful white mass

Dibromo naphthyl MP 215 not attacked by alcoholic KOH. 1st Supt 855

Tetrachlorohydroquinone 1st sup 988 see under this heading Diethyltetrachlorohydroquinone MP 112 not affected by boiling KOH aq - also - Diacetyl-tetrachloroh—e

Dioxyretistine, red powder not dissolved by KOH aq or oxidized by chromic acid Soluable in Benzol.

Sassafras oil. 1st Sup 1014 — nine tenths passes over on the 1st distillation between 230 + 236 consists of Safrol. $C_{10}H_{10}O_2$ insol water SG 1·114 at 0° remains liquid — 20 C Converted by alcoholic KOH at 180 to black uncrystble resin. Safrol is converted by Phos pentachloride to thick tenacious mass of Monochlorosafrol. same thing produced by one part Safrol + one part bromine. Melted KOH attacks Safrol with difficulty Sassafrass oil is cheap —

Ethyl-thymol 1st Sup 1090. aromatic liquid insol H_2O BP 222 oxidizes slowly in air, KOH dont attack even when heated.

Diacetyl-trichlorotoluhydroquinone — MP 114 — dissolves sparingly in water not attacked KOH aq heated.

Benzamide 2nd Sup 80.
MP 192 Cryst insol H_2O. not affected by KOH.

Rubber

Anthracene Orange 2nd Sup 86.
MP 225 sublimes above this
KOH or nitric acid has no action

Anthrachrysone 2nd Sup 86.
Green powder dont melt even at 320 C
can be distilled with decompstn H_2O only
dissolves traces best solvent glacial
acetic acid, other solvents nq —
not attacked by Sodium amalgam.
Mg salt amorph red precip — Ba salt.
Cryst flaky — fusing Anthrachrysone
with KOH large quantity humus like
substances formed.

Diacetyl-phenanthrene-hydroquinone
2nd Sup 94 — MP 202 not oxdzd by
Sulphuric + Bichromate K not attacked
by heating with KOH SG 1.3 but is
by higher Concentrations —

Azodiphenyl blue — KOH precips the
base from Conc alcoholic solution
mod H_2O.

Rubber

Monochlorobenzine SG 1·12 at 0°
BP 131 not attacked by KOH or K itself at
ord temps

Trichlorobenzine MP 17 BP 206.
strong not unpleasant odor SG 1·57
not attacked by KOH in any form even on
heating

Dibromoazobenzine MP 205 not attacked
by KOH. 2nd Sup 148 Sol Chloroform.
boiling Benzol CS.

Tetrabromoazobenzine MP 320?
not attkd KOH. at MP commences
blacken & decomp.

Benzile tetrachloride MP 153 not
attacked alcoholic KOH.

Benzylene-diacetimide Cryst
decomp 200 slightly sol H_2O not
affected boiling KOH or NaHg

Carbazol 2nd Sup 254 insol water MP 238 boils 338 not decomposed by passing through red hot tube. not decomp by fused KOH. or heating to 200° in Alcoholic KOH.

Chlorohydrins — Watts 2nd Sup 318 Dichlorohydrin heated with alcoholic ammonia yields NHCl + Chlorhydrinimide white, amorphous, insol H_2O Ether or Conc acids not acted on by boiling Sulphuric & Aqua Regia or strong KOH. in hot water it swells up enormously yielding a perfectly trans jelly

Bromocymene 2nd 420 not attkd KOH.

Indigo — Comel purified in KOH lye dissolves out several things leaves pure indigo behind, Contains 25% ash treated with HCl leaves 3% $CaPhO_4$ 2nd Sup 667.

Smell of Naphthalene due to Leucoline oil - which is seperated by boiling in strong sulphuric a + precipitating resulting brown solution with ammonia

Bases

Nitropapaverine a base cryst, not sol in KOH. 2nd Sup 891

BP of paraffines.

Butane	1
Pentane	38
Hexane	70
Heptane	99
Octane	124
Dodecane	202
Hexdecane	278

Acetophenone - a base MP 130 not decomp at red heat by Sodalime or oxdzd by chromic acid -

In experimenting with hydrocarbons Use Picric a + Fritisches Reagent to form salts decomp by KOH or NH4

Rubber

Sulphotoluide 2nd 1125 MP 155
not attacked by Alcoholic KOH at 160 C

Acetanilide-chloride, action heat gives hydrochloride of a base which is precip by KOH to an amorphous base. 3rd sup 3

Azophenin, MP 224-watts 3rd 138
not attacked by KOH.

Dinitrometatribromobenzine MP 187
not attacked by KOH. 3rd 181

Diphenylnitrosamine MP 66 unacted upon by acids or alkalis 3rd 209

See Sulphur 3rd 211 Sulphur in dye
its likely that aniline & other bases precipitated by KOH & not acted on can be further changed by heating with Sulphur

Nitroisopropyl-azobenzine 3rd 214
yellow oil, heavier than water, not volatile
alone or with vapor water quite insol
in alkalis --

Conima or incence resin insoluble KOH aq
or Alcoholic KOH. Amorphous.
3rd 555

Dimethyl-aniline-Phthalein 3rd 650
insol KOH.

Dibromodinaphthylmethane not attacked
by boiling alcoholic KOH 3rd sup 653.

Dibromofluorene MP 167 not attacked
by boiling alcoholic KOH.

Dinitrostilbene — insol KOH + most all
other solvents MP 280 3rd 677

Ditolyl — hydrocarbon easy made
not altered by heating ½ hour
to 500 Cent.° 3rd 691

Ditolyl-Ethane action acetaldehyde on Toluene – aromatic oil, BP 298 C !

A very viscous substance at ordinary temp which has solvent properties on crystlzd substance will render a large quantity amorphous.

Beer glass. Si 75% CaO 5% N_2O 18.6% why if silica is fully satisfied with bases should it be disolved by KOH. possibly FeOH or MgO mixed with silicate soda as binder + fused would be ok as seperators.

Isolepidin 3rd 1176. not affected by Alcoholic KOH. becomes resinous on distillation, ditto Oxyisolepidin

Nitromanitan 3rd 1267 by boiling with alkalis makes it a black gummy non explosive mass

Bromodimethylaniline 3rd 1308.
not altered by boiling KOH aq insol in KOH. Cryst MP 55 BP 247 its a base

Iododimethylaniline, a base acts as above

Nitrosodimethylaniline a base insol KOH MP 92 slightly volatile in a current of steam 3rd 1309.

Dimethylaniline-Phthalein base not sol KOH not attacked at 200 3rd 1310 see reduction products also bases

Nitrosonaphthols 3rd 1363
α- & β bases insol in KOH.

Methyloxysulphobenzide MP 130 not sol KOH. 3rd 1475

Dinitroethyloxysulphobenzide cryst insol KOH. 3rd 1475

2 Bromophenanthrenes not attkd by alcoholic KOH. 3rd 1514

Highchlorinated Phenanthrenes not affected by Alcoholic KOH, 3rd 1515

Phlorobromin MP 152 decomp high temp in sol H_2O not attacked boiling KOH. boiling nitric acid or NaHg – 3rd ~~1570~~ 1570

Pyrroline 3rd 1728 Methyl Ethyl, & Amyl pyrrolines liquids BP 113 131 & 180. not attacked KOH.

Dinitrotoluene treated with Sodium Amalg gives black uncrystalizable mass. 3rd 1994

Orthoditolyldizin not attacked KOH aq MP 55 volatilizes readily with water vapor 3rd 2032.

Tribenzoylene-Benzine 3rd 2041 dont melt at 450 C. not attacked by boiling KOH aq or Bromine.

Vascoluse a variety of cellulose not attacked by KOH. except at 200 C under pressure Kernels of Apricots contain 50% of it –

Phons

Hydroxyacetal, aromatic liquid BP 167
Roscoe & Sc Vol III Pt 2 69—

Aldehyde Ammonia in alcoholic solution changes quickly on heating giving an amorph base called Aldine

Thialdine $C_6H_3NS_2$ R&S No 498 Monacid Base

Glycocyamidine – or Glycolyl-Guanidine
R&S No 516 Base

Creatine, neutral Base

Creatinine Base

Glyoxalin Base

Oxamide (perfectly neutral) white powder

Chloroxalethyline, Base oily, narcotic smell
BP 217 Tertiary base R&S 533

Oxalethyline same as above BP 212

Propylene Oxide + all the hydrocarbon oxides are Bases.

Propylene-diamine Base

Hexpropylene $C_{18}H_{36}$ BP 390 to 400 C ?

Theobromine
Caffein
Methyl-guanimine } Bases
Alkylamines -

Furfurin Base

Sulphonic acids can be heated strongly without decomp. - are not attacked by boiling KOH. & only oxidized by Nitric acid with difficulty

Tetrandromethane C. $(NO_2)_4$ Colorless mobile liquid cryst at 13.C. BP 126 neither explosive or inflammable ? ?

Ethylhydrazine Base destroys Cork + Rubber.

Tetraethyl-tetrazone Base

Triethyl-phosphine extremely stable body not attacked by Nitric or KOH. MP 44 BP 240

Triacetamide – perfectly neutral.

Propylpseudonitril solid insol H_2O acids or alkalis –

Isopropyl phosphinic acid solid paraffine like mass xo 364 R+S MP 60 to 70

Tertiary Nitrobutane aromatic liquid BP 110 to 130 neutral not attacked by Br or KOH. $(CH_3)_3 C.NO_2$ –

Hexachlorobenzine MP 226 ins of water not attacked KOH. or boiling conc acids

Anilin Bases.

Chlorinated Anilin bases.

Metanitraniline MP 114 BP 285 sublimes
not attacked by boiling KOH.

Amidodiphenylamine Base of
Tropaeolin OO Comel.

Sulphones have neither basic or acid qualities

Mauveine, a base of an aniline dye.
very powerful base.

Safranine, an aniline dye. has a powerful
base in it unaffected by KOH. sometimes
called Tolusafranine. The base is a
hydroxide - it can be reduced oxidized
possibly replace N_2OH. in Bat. RTS No 1091
Salts of Safranine <u>not</u> decomp by KOH ?

[ITEM FOUND IN BOOK]

No 5 no foaming
12 terrible foaming
with only few drops in good No 1
froths 2 inches
3 drops will froth at 2" or more
in first 3 minutes there is no humps
as it disappears on 4 humps when
electrodes are only in 1/4 inch

No 19 No foaming
18 No foaming
4 No foaming
11 foams very bad but not so bad
as No 12 albumen comes up
much only more with 50 drops
in 100 cc

No 1 1/8" bad foaming with strong bad

Notebook, N-04-02-03

This notebook covers the period January 1904-February 1905. It contains notes, primarily by Jonas W. Aylsworth, regarding storage battery experiments. There are additional entries by Edison and by at least one unidentified experimenter. The tests are numbered from 998 through 2204 and pertain to nickel flake for the cells. The entry for test 2195 contains Aylsworth's discussion of reasons for the loss of capacity in the commercial cells, and the tests that follow are attempts to overcome this problem. The front cover is labeled "Storage Battery Experiments #998 to 2204 J W A" and "Somewhat Important." The inside front cover is inscribed "Record of Experiments Edison Storage Battery Co. From Feb 3/04 to ." The pages are unnumbered, and at least one page has been removed from the book. Approximately 190 pages have been used.

Only tests 998-1065, which contain entries by Edison, and tests 2195-2204 regarding the capacity problem have been selected.

Record of Experiments
Edison Storage Battery Co.
From Feb 3/04 to

#798. 36 RA

a

3.82 fine graph. Roll 15 min. wet
3.2 cobr neg cell.

b

3.82 fine graph. Roll 15 min dry
3.2 cobr neg cell

c

3.82 ~~XXX~~ fine graph. carefully TAE
3.2 cobr neg cell

999.

999

Reg Sulphate Nickel crystals powdered
treated with 20% NaOH - hot in excess of
NaOH, made mushy & dried, then washed
hot 4 times, then solution drawn off &
NaOH added & boiled, then washed 4
times hot & finally dried - to paste
& bulky appearance

A. Rolled Wgt. H_2O 842 Recovered graphite
15 minutes rolling = 3 reg cells

B - Finger mixed XX graphite by Edison

1000

Regular old process nickel. served to 1/40 inch about + mixed with recovered graphite
8+2 – 2 drops mixed at 6 y heard moving the graphite slightly moist,

#1001 5-12-0

a 2995

8 + 2 from graphite roll 15 min wet
3.2 clay as add

b 2996

8 + 2 from graphite roll 15 min wet
3.2 cl remove my glass 12 hrs

1002

Acid in buff gum buff 1/2 coarse
graphite & the graphite to change
24 hrs & deliver to T.A.E.

#1003. 53 RQ

(a)

8 1/2 fine graphite roll 15 min with K_2O
3.2 gum dry amount as roll.

(b)

8 1/2 fine graphite roll 15 min with K_2O
3.2 gum dry charcoal 12 hrs

1004.

#955 1/2 through 80 mesh
3.2 of 955 1/2 .32 xx fine graph.

#1005. 63 RQ

graphite + K_2OH

a — ~~stuff plaster~~ —
3.2 gum dry sum req.

b — 4 1/2 1/2 coarse graphite roll 10 min dry
3.2 gum dry. ch. sea.

#1006. 64 RA.

a
stuff plain.
3.2 dry

b
4½ to ½ coarse graph roll 10 min
3.2 dry ch neg.

#1007. 65 RA.

a
stuff plain.
3.2 dry. ch neg

b
4½ to ½ coarse graph roll 10 min dry
3.2 dry ch neg.

1008. 66 RA

a
stuff plain 3.2 neg cell.

b
4½ to ½ coarse graph roll 10 min dry
3.2 neg cell.

#1009 #58 Ra

a

Stuff plain
3.2 gm ch neg –
light pressure crimp.

b

9+1 coarse graphite roll 10 minutes –
3.2 ch neg.

1010

Reg ored NiOH by new process NaOH
Seived through 20 caught on 80,
treated 15 minutes in solution of
Ammonia containing NH4 Sulfate,
then soaked water, washed + dried
8+2 wet rolled 15 minutes
fine graphite

1011

Same no. 1010 but soaked in Solution
30 minutes washed + dried
8+2 Rolled 15 minutes wet.
fine graphite –

1012 -
Same as 1010 but soaked in
Nelly Sulf and Nelly Solution for one
hour coarsed and dried,
842 wet rolled 15 minutes, fine
graphite -

1013. 2/4/04

a 3.2 gud neg KOH & f. of MiOH & indicator found & achieved through no cu. 50.

Put in cell & charge for 7 days at 200 rate
Run at 150

1014 2/4/04

Same as 1013 but in cell of ch 24 hrs & put on to run when Mr Edison is here & give to him when it runs to 1.20 bottle

1014a

1014 taken out of fortite dried & refused. beautiful colors on the granulated stuff.
Run without charge against a charged Fe in cell at 150 rate.

#1015.

Same as 1013 put in cell.
at 24 hrs in 33% KOH
& run in 33%
for second time.

#1016. 2/4/04

Same as 1013 put on
at for a week in 33%.
& run at 150.

1017. TCE.

Anode in sulphuric [illegible]
[illegible] half [illegible]
[illegible]

Anode [illegible] fine graph [illegible]
[illegible] clean [illegible]

8 [illegible] coarse graph [illegible] 2 min [illegible]
[illegible] graph [illegible]

1018.

Same as 1010, but 2 hours in Ammonia + NH_4SO_4 solution then washed dried and put in engine for 1/2 hour then washed + cooled wet put into fresh Am Sulf solution then washed warm water + dried.

842 - wet rolled 15 minutes fine graphite —

1019. 57. Ra.
in C_2O_4 precipitated with graphite
by dissolving 120 mix in H.Cl.
& ppt by Oxalic.
The ppt treated with KOH &
washed & dried.

a

make 3.2 cake of plain stuff.
ch reg as a cell.

b

4.5 of 1019 + 15 gum. fine graphite
roll 10 min dry.
3.2 gm dry. ch reg. as cell.

~~#~~ 1020. #52. Ra.
Double ~~oxalate~~ ppt of ammonia
by ppt by 43% KOH washed
& dried. -

a

8 + 2 mix fine graphite wet H_2O,
3.2 cake dry. roll 15 min.
ch reg as all.

b

8 + 2 mix same as a
3.2 cake ch reg 12 hrs -

1021. 2/5/04

25 gm #126 mix with 20 cc conc H_2SO_4 added & then 10 cc conc HNO_3 & left on hot's over night washed the all out & added to a sol of 10 gm mix treat the same except not washed. The whole fl. by large excess of 20% NaOH. washed ~~once~~ & dried & re washed till free of SO_3. The mix will contain 66% $Li(OH)_2$

a

Plain stuff. 3.2 reg cell.

b

#1021 rolled 10 min moist with ½ cc KOH to 4 gm. 3.8 gm dry.

c

Same as (b) / stuff reverse 12 hrs ~~cold~~ in 5% KOH.

#1022 2/5/04

25 gm $Li(OH)_2$ dissolved in HCl. + 2 gm Bi dissol in ~~HCl~~ water to which was added a little HCl (it didn't dissolve easily + nitric was added) the Bi sol is poured into the Li sol. + the combined sol is poured in to hot conc sol of Oxalic acid containing a little alcohol. The combined oxalates are thrown down ~~at~~ once as a very fine crystalline precipitate. It is washed 4 or 5 times & then treated with large excess of KOH. ~~[illegible]~~ + washed till free of KOH.

a = 3 gm above dried stuff + 1.75 gm coarse graph. roll 15 min wet H_2O. c = 20% graph.

3.2 dry reg cell

b = 3 gm 1022 dry. + 1.3 gm coarse graph. roll 15 min wet KOH. = 30% graph.

3.2 dry reg cell.

c = Same as (b) except wet H_2O. ch reverse 12 hrs in hot 5% KOH. in glass

1022

d

Same 1022 not dried and less
moisture determined = 32% $(NH_4)_2O$
21 gm wet stuff + 1.68 gm xx fine graphite
ignited & dried. = 8.42
yield = 8.75 gm when dry.
Make grind 3.2 gm. stuff put wet in
neg. cell.

e

Same as (d) 3.2 gm ch. recover
in hot 5% KOH for 12 hrs. in glass
Put in cell & ch. neg.

1023 –

Solid Crystals (large) Ni Sulfate.
NaOH 20% poured on heated
& Evap to much – dried –
then washed 4 or 5 times,
then water poured off to a much
& fresh NaOH put in boiled,
Then washed till no NaOH or
Sulphate, dries to aggregate
of very small pieces.
8+2 Rolled 15 minutes, wet,
3.2 fine graphite ~

1024 –

Reg new process NaOH washed on 80 mesh – dry – treated several hours with Ammon double salts (Sulfate) & washed & dried between the two actions. Then dried and placed on filter paper & put over an evap dish containing NH4 Sulfide & turned until black on outside only. There are some pieces not covered the penetration is about 1/10 of whole, dried on paper on hot plate 8 & 2 mixed by hand by strong fine graphite, 3.2 –

1025 Same material put in Bomp just as it is without any graphite ~~[illegible]~~ 2 1/2 gramm

1026 – 200 mesh cliff – Reg Ni by NaOH process – treated with ammonia + NH. Sulfate. Twice + dried Calcined – Wire had weak – took all day – 8+2 Rolled wet fine graphite – 3.2 Rolled 5 minutes –

1027 Same as 1026. But Sulphided on paper by fumes of H_2S NH_4 8+2 fine graphite mixed by finger 3.2

#10.28 58.R.a.

(a)

Roll 4.3 gum #58 with 1 c.c 20% KOH.
dry + make 3.2 cake.
clingy as cell.

(b)

Roll 4.3 gum #58 with 1/2 c.c. 20% KOH.
dry + make 3.2 cake.
clingy as cell. 2263.

#1029 60.R.a.

a

Make 8 x 2 mix fine graph roll 15 min
3.2 cake. very cell.

b

Same 8 x 2 coarse graph roll 15 min
3.2 cake. very cell.

#1030 Ra.

3.6 gm graph. of the 1031 mixed in forte with 1 c.c. 10% KOH, & dried (in vac)².

a.

Plain powdered stuff.
3.2 cake dry light pressure
my cell.

b.

Plain stuff ~~powered~~
3.2 cake dry light pressure
~~[illegible]~~ reversed 12 hrs in
5% KOH in hot plate at 200.

c.

4.5 gm #1030 to 1.5 gm coarse graph
with dry 10 min.
do very as cell.

Not enough stuff.

2/6/04

1031 J.W.C.

Some 1021 final washed is put against a sheet of lin & cloth wrapped around & ~~slated~~ in hot sol for 5 min. then washed 2 changes + a little KOH added & washed more hot. cake 3.4 to allow for lin photo - pressed @ 500-500. cal 82-103-104

#1032.

Some. 989 final washed, 2 cated in a little cuf. in hot sol in glass & stirred with stirring. Heated at 2½ amp for.

1033 —

80 mesh new process. Pt. NaOH process — treated KH Double salts considerable & used for following Experiment, moistened powder dotch 43% KOH till damp then used flake graphite with fines screened out thro 80 mesh, then mixed with spatula in big porcelain glass — it kept granular & with graphite used it could be alone but a big mixing longer time, its not very perfectly coated as big flakes have not much coating power — Dried it out so it felt dry but dried it 20 minutes so it could pass in next experiment 3½ gram Cake — graphite [illegible] — Run Reg

1034 — Same as 1033
but made smoky + semi dried —
it will be put in 1m 1/8 inch
Chunks & probably flowed
although there will be larger
voids to start with

1035 —
[illegible] alternate layers of coarse mel —
1/4 & coarse graph. 6 layers of thin.

1036. 69. RA.

Ni C_2O_3 fd. with graphite & treated with Na. OH. washed twice & dried then washed completely.

a

Grid made 3.2 plain stuff. charges all.

b

Grid made 3.2 plain stuff charge 1.5 line in 5-% hot KOH.

c

Grid made 4.5- to .5 gms. coarse pr. Cache 3.2. Bag cell.
Not enough stuff.

.04
.520

1037 2/8/04

2.82 gms. 200 mesh. Ni OH, hot treated with double double cutter.
This is mixed by V.A.E. with gold leaf. 811 proportion of 7 leaves fine & one leaf left coarse. = .32 gms.
Grid charged my 12 cells.

1038.

Made a mix as follows –
7 gms. #958 + 2 gms xx fine graph –
roll 15 min moist with 1 c.c. 20% KOH.
Then dry at gentle heat & add
1 gm coarse graph. & roll 10 min dry.

a.

3.6 cahn = 2.52 $LiOH_2$
dissolving on cell.

b

3.6 cahn some on a recept. ch. recent.
12 hrs in 5% KOH.

1039. 2211 a

Since #2211 & 2212 changed
Mix opened up & stuff taken
out washed & dried &
good made up. 3.2 cahn –
Reg. cell ch & run reg in 2% KOH.

1040 RA

nitrate of $Ba(OH)_2$ ff. with 5% NH_4OH in the usual & dried.

a

Plain stuff 3.2 Ray cell.

b

4½ to ½ coarse graph. Ray cell 3.2 calc.

c

Plain stuff 3.2 charcoal in 5% KOH hot at 200 in glass.

1041 RA.

a

Plain stuff 3.2 Ray cell.

b

4½ to ½ coarse graph Ray cell 3.2 calc. NOT ENOUGH STUFF.

c

Plain stuff 3.2 calc charcoal in 5% KOH hot at 200 in glass.

1042 -
2 oz weak Ni 6 oz NaOH reg process
treated 6 oz Double Hfsalt —
put in gold 310, no graphite —
Grid soaked in Silvering solution
& dried & resoaked & dried 4 times
then put in Cell — Rochelle acid
Solution —

(2 ok)
1043 - a Regular charged
24 hours then put in water
for 1 or 2 hours & then
Reversed and run in Water
~~hours changing~~ changing
the water every 2 or 3 hours
until it shows only traces
of KOH. Then ~~we~~ run until
Current will not pass,
then soaked in large amount
of water for 2 days & then run
Regular — KOH Charge discharge

1044 — Regular Charged 24 hours — Nickel Taken out & put in large bottle with distilled water & kept warm & water changed from time to time until no alkaline reaction then put in & Run Regular in 21% KOH.

1045 — Regular put in water only & charged the KOH in nickel beaker sufficient to give conductivity — then water changed & Charged steel further until revolutions gets too high then removed from little bottle & — Soak in large jar in water until no alkaline reaction — then put in little bottle & Run Regular in 21% KOH.

1046 2/7/04

71 RQ

$MnOH_2$ & Together with $MnOH_2$
5% $MnOH_2$

a

8 & 2 fine graphite wet H_2O, wd 15 min.
3.2 cohe reg cell.

b

Same as (a) ch nowise in 5% liq
KOH. 12 hrs in glass.

1047 73 Ra.

$MnOH_2$ & $MnOH_2$ & for together
10% $MnOH_2$.

a

8 & 2. fine graphite wet H_2O wd 15 min.
3.2 cohe reg cell.

b

Same as (a) ch nowise in
liq 5% KOH 12 hrs in glass.

1048. R.A.

(a)
4.3 Gms. #1048 Ground fine.
1 cc. 2% KOH
H_2O to roll good.
Roll 20 min. Dry and make cake
3.7 Gms. Light Pure
Chge. rig as cell.

(B)
4.3 Gms. 1048 Ground fine.
1 cc 5% KOH
H_2O to roll go
Roll 20 min. Dry make cake 3.2 Light Pure
Chge. rig as cell.

(C). 4.3 Gms #1048 Ground fine
1 cc 10% KOH. H_2O to roll good
Rol. 20 min. Dry make cake 3.2 Light Pure
Chg. Rig as cell.

D 4.3 gms #1048 Ground fine
1 cc 15% KOH. H_2O to roll good
Roll 20 min. Dry make cake 3.2 Light
Press. Chg. rig as cell.

(E) 4.3 gms #1048 Ground fine
1 cc 21% KOH. H_2O to roll good.
Roll 20 min. Dry. make cake 3.2
Light Pure. Chg. rig as cell.

1048.

(F) 4.5 Gms. 1048 Fine ground.
1 cc. 20% KOH. H_2O to roll good.
500 Gms Coarse Graphite
Roll ete. same as (a)

(G) 4.5 Gms 1048 Fine
1 cc 5% KOH. H_2O to roll good
500 Gms Coarse Graph.
Roll ete. same as (a).

(H) 4.5 Gms 1048 Fine
1 cc 10% KOH. H_2O to roll good
500 Gms Coarse Graph.
Roll ete. same as (a)

(I) 4.5 Gms #1048 Fine
1 cc 15% KOH to roll good
500 Gms Coarse Graph.
Roll ete. same as (a)

(J) 4.5 Gms 1048 Fine
1 cc 21% KOH. H_2O to roll good
500 Gms Coarse Graph.
Roll ete. same as (a)
not enough stuff

1050 R.A. #70

Some #56 treated with 20% NaOH. then washed 3 times & treated with 15% for 3 days. washed free from Cl. Tested 3 washes with Ind. K.I.

a. I.
4.3 grms #1050
½ cc 21% KOH. Roll 20 min.
charge reg. as all.

b. I
4.3 grms #1050
½ cc 21% KOH Roll 20 min
charge reverse in 5% KOH hot 12 hrs in glass then charge direct
2 times.

C.
4.5 grms #1050.
.5 " Tenax ref.
½ cc 21% KOH Roll 20 min
charge reg. as all.

D. Duplicate of C.
Charge like B.

1051 R.A. #68.

Some of #56 treated with 4.3% KOH. washed twice then hydrated for 3 days & washed free from Cl & dried then made into quids same as 1050.

a
4.3 grms 1051
½ cc 21% KOH. Roll 20 min.
charge reg. as all.

B
4.3 grms 1051
½ cc 21% KOH Roll 20 min.
charge reverse in 5% KOH hot 12 hrs in glass then charge direct 24 hrs in all.

C.
4.5 grms 1051
.5 " Tenax ref.
½ cc 21% Bicarbonate Roll 20 min
charged as all.

D
Duplicate of C.
Charge like B.

1052. R.A.S.C.

95%. $Ni(OH)_2$ = 29.2 cc sol = 30 gms.
1.5 gms $Co(OH)_2$ = 3.5 gms K.C.O.

(a)
8 + 2 fine graphite wet 3 cc KOH 21%. ~~dry~~ Roll 15 min. Dry. 3.2 gm cake neg cell.

(b) Same as (a) chg. reverse 12 hrs in glass ~~wet~~ 10% KOH cold, 70 mins then dist 24 hrs in 21% in cell. ~~[illegible]~~

1053. A.S.C.

90% $Ni(OH)_2$ = 30 gms Dry.
3.3 gms = $Co(OH)_2$ = 10%
7.4 gms K2 CoO_4

(a) 8 + 2 fine graf. wet mixed 3 cc KOH 21% Roll 15 min. Dry. 3.2 gm cake neg cell.

(b) Same as (a) chg. reverse 12 hrs in glass in 10% KOH cold @ 750 rate then dist in 21% KOH in cell (24 hr) then run.

1054 R.A.

85% $Ni(OH)_2$ = 30 grms Dry.
15% CuOH/2 = 5.3 grms
11.9 grms K_2CrO_4

(a). 8 + 2 fine Graphite wet s. c. 22% KOH Roll 15 min. Dry. 3.2 gm cake Chipped as all.

(b) Same as (a) chg. reverse in 10% KOH cold in glass @ 750 rate, then direct in 21% in cell 24 hrs + rim.

1055 R.A.

a

8 + 2 fine graph. roll 15 min moist with 1 c.c. KOH 10% + H_2O to suit demand, dry & make cake 3.2.

b

8 + 2 coarse graph moist H_2O roll [illegible]

c

Same as (b) reverse 12 hrs in 10% KOH [illegible]

✓

1056.

3 gms #63 Reg in. ground fine.
1½ " x fine graph.
1 cc. 33% KOH. + H_2O to make right mixt.
Roll 20 min then add 1 gms coarse graph
+ roll 10 min dry powder = 23.8% graph.
+ make 3.3 gms dry. = (2.62 gms lab. O_2)
a) dr reg or cell. (begin exp. to fusion)

✓

(b)

Same as (a) dr reverse 24 hrs in 5% KOH.

✓ #1057.

~~2 gms~~ 7 gms #63 ground fine.
2 gms x fine graph.
1 cc. 33% KOH.
Roll 20 min + add ½ gm coarse graph +
roll 15 min. + dry

a

✓ 3.45 gms dry of above. dr + min reg

b.

✓ 3.45 gms dry dr 24 hrs reverse in 5% cell.

1058. R. L.

100 gms #1048 Ni + NH4Cl = 13 gms R. p.
½ cc NH4OH. =
suspension Paste + dried on glass plate.
(a) N. 3 gms #1058.
½ cc KOH 21%

1059 R. L.

1060 R.a

1061 R.a

1062 R.a

1063 R.a

1064 R.A.

1065 = Nickel precipitated with KOH containing Chromate K — & Sulphate Nickel both hot, Washed & dried — 842 pure graphite, Rolled wet with ½ percent KOH in the water rolled ten minutes 3.2 Cake —

#2195. 12/21/04

My explanation of the cause of slow falling off of capacity in cells is as follows -

1st Owing to concave footed a foot is stacked in the wall of the foot which is when it becomes nearly flat when there is not enough mechanical pressure to prevent the gas pressure from separating the cup more or less from the cake during charge where a deposit can slowly accumulate on the cup inside & prevent good contact when the elasticity of the steel brings the cup back on the cake after charging stops.
Each charge allows a little more of this deposit to accumulate.
The deposit may be the corrosion of the Ni plate due to weak potash & acid radicals also Fe_2O_3 Al_2O_3 & Mg_2O & organic
So pion of $Ni(OH)_2$ corrosion hints make good with cup having this deposit or clean by charging in weak KOH.

containing some KCl.
Tests made with these cups if they go bad will show that the only solution of the problem of prevention of loss of capacity lies in mechanical construction so that it will be impossible for the cake cup to get out of contact at all.
If the cup & cake never get out of contact the insulating deposit can never form.
The pressure of corrugating may break through the film formed with the test cups hence before coming to final conclusions it will be necessary to ascertain whether or not the film has been broken by making up the grid.

If the tests go bad see if ~~cups~~ reuse don't improve.

#2196.
$NiCl_2(H_2O)$ is made by precipitating 500 cc of $NiSO_4$ sol sp. gr. 1.157 by pouring into large excess of Na_2CO_3 sol washing by decantation

#2197 2/16/05

JBO grids are made of 3 gms flake Ni mounted with one neg & charged in 1½% KOH containing a very small quantity of KBr. the object being to so regulate the strength of KOH, so that the flake Ni made will be attacked & active Ni formed but with sufficient KOH to prevent the acid radical from attacking the cuf on the outside.

It is charged in this & then put in 21% KOH & charge neg & run neg.

#2198. 2/21/05

ie group of 5 Ni are made up with 3.2 gms of .004" pure nickel to be mounted with 2 Fe neg & charged in 1½% KOH containing 10 mg KBr to each cell. The idea being to form the active material by charging, if the grid blackens on outside it will be necessary to add more KOH.

Ch #8 has been ch 15 hrs in neg 21% & run.

Cells #3576 + #3577 are the same as above except for this difference, they were held to yellow heat in hydrogen before assembling the idea being to weld the cuf together & to the frame & the flake to the cuf.

2199.

#2174 (hyped carbonate Li) is heated in current of Hydrogen for 1½ hrs at 190°C in a cream bath.
The product was green but changed to a dark brownish grey on exposure to the air.

#2200 2/22/05

Tried to make nickel flake metal by passing Hydrogen over a mixture of fused $NiCl_2$ in $ZnCl_2$ at low red heat — say about 800° F.
Result his flake metal but an abundance of a sub chloride in this scales like graphite were formed, they were not soluble in hot water & could be separated perfectly from the $ZnCl_2$
They are transparent & almost colorless but when a mass of them are viewed they leave a greenish-brown yellow color
Treated with hot KOH they turn greenish & do not change shape or swell.
Mixed with calcium oxide powder & reduced by hydrogen at bright red they are reduced to fine flakes of metal without change of shape.
The CaO is removed by water followed by dilute HCl.

2201.

The micaceous nickel chloride of 2200 is cooled in ingot iron of K over night.
Result is prismatized his in laminae much resembling graphite.
It is reduced by H_2O_2 to green transparent scales.
The prismatized is a poor conductor of electricity but is nevertheless a conductor.

2202.

The micaceous his chloride of 2200 is treated to K_2S dry in tube, it get hot & changes to sulphide & when more strongly heated chloride but still has the laminar structure & is a good conductor almost as good as graphite.

#2203 2/27/03

$Ni(OH)_2$ Reduced by Hydrogen
at 400° 5 lb #. 20
simmer to about ½ of original vol.

60
.05
2.50

18.5

25 / 1420

#2204. 2.5

Nickel acetate neutralized by
ammonia has a little of a sol
of egg albumen added & some
H_2O_2 - this converts the whole
into foam which was dried
roasted & reduced by the 5 lb Hydrogen.

292 | 30 / 10 — 10 | 520 / 50 — 50

1. 2½ — 4½

60 | 25 — 2.4

100 — 2 — 24

20
30 — 60
45 | 16 — 4
22 — 28 — 240
130

1100.0 — 925 — 175.0 — 165 — 6

1.6 — 300 — 480.0

45 — 16 — 5.4

280 — 1.6

16 80
2 80
448.0

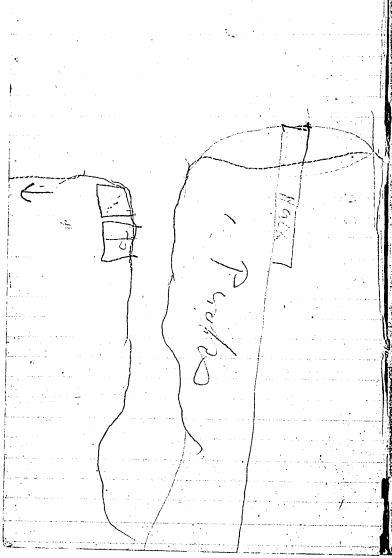
448
450
898 | 177 — 8.6
17 — 13 — 6.4
128 — 2.2
237

13
5
45

Notebook, N-04-03-05

This notebook contains dated entries from March 1904. All entries are by Edison. Most of the notes and drawings relate to storage batteries. Included are items pertaining to the composition of the grids, separators, and electrolytic solutions used in the cells. There are also notes concerning compounds for use in alternating current rectifiers and phonograph cylinders; and a 3-page memorandum concerning the organization of a company to manufacture and sell batteries, possibly in Germany. The pages are unnumbered, and at least one page has been removed from the book. Approximately 70 pages have been used.

X E 172 040305 N-04-03-05



Myers March 5 1904

213

Precipitate together from the soluble salts.
from 90% X 10% - ~~Use excess~~ KOH to evap to much dry + then remove free basic salts + try a pocket direct -
Try another portion, reduced by Hydrogen + mixed with Mercury only 15% - Another part without Mercury -
Following metals 10% - Zinc Tin, Lead, Copper, Cadmium Antimony Bismuth, Nickel, Cobalt, Manganese, Cerium, Tungsten, Molybdenum Uranium Vanadium - Chromium - Silver,

Since we get over 100 mil amp hours to 1 Volt with Bismuth hydroxide - whereas 80% of it only gives .40 to Volt there must be some unknown metal in it which has an Endothermic reaction oxide, Make a lot of Experiments by fractional precip + crystlzn + alternness to seperate it, + use the Cell as a test an measure in the Milamp hours to a Volt from the indicator

Mch 5 1904

For battery plate separator, try minimum amount of Magnesia that can be put in stick form using Rubber dope as a binder alone – also sheet treated with vapor of CS_2 – also flowers sulphur incorporated in dope – also Rubber + sulphur dissolved in Bi Sul Carbon + used as binder + then Vulcanized by steam

Also try Nitrate Nickel as binder for Magnesia, – ignite, thus make Ni_2O_3 –
also try acetate Iron, Nitrate Fe syrupy as binder, – also acetate Magnesia, syrupy Bismuth hydroxide + heat,
Try as binders, asphalt, asphalt with S
Asphalt in CS with S, + Vulcanize –
Try Carb Sr Ba, as base – Oxalate Ca
Ba Sulphate,
For binders search Watts for bodies of Resinous character insoluble in Alkalis – of organic nature
Remember Carpenter Chloride Asphalt got so by Sulphur.
Try Balata – Gutta percha as binder

Mch 5 1904

Use as a rectifyer for alternating CO_5 Cells in KOH plain Ni or amalgamated Fe possibly some radical in KOH up to Certain amount at first.

~~Ok~~ its not reversible,

Could use mounted parchment paper KOH, just damp a plain Ni or Fe or Fe plated Ni or plain Fe - make ~~[illegible]~~ used like a dry Condenser,

For recording matter Cylinder use the amides of the fatty acids, also Ammonium Salts - They are flexible & Easy to cut, They can be shaped to get right proportions -

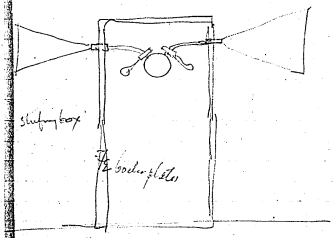
possibly with Sleeramic Cones

use sunrow record as it can be cut deep & use Saphire point

March 5 1904

Make a double phono record master with two different times on. Time. –

An iron chamber of Gordon plate + two recorders



Record simultaneously –

Get some of the sticky Petroleum residue called "Bull S" & distill down see if can get lamp oil for phono work.

Mch 5 1904—

Acridine - a base not attacked by KOH. not oxidized
Aniline black powerful base insol KOH
The green salt I got with HCl. Chlorate. should have been bleached with KOH to free the base —
Triphenylmethane in Gallein grid ~~also~~ as well as bonder for separation —
Benzamide & Anthraldehyde - see Wolff 2nd Sup 80
Chrysaniline Orange Mp 225° unattacked upon by KOH.
Anthrachrysone 2nd Sup 86 — " "

Abietin, not attacked or by KOH.
Monochlorobenzol unattacked not attacked by KOH — aromatic odor boils 155 Cent.
Nap dew 5.32 perfectly neutral —
Dichlorobenzol 2P. 180° aromatic odor of the not attacked by KOH.

Gaseous Hydrogen is passed into acrolein
Tissol — acids or alkali - Cottam Medine

Amarine not attacked by fused KOH Solid Resin
~~Amarose~~ Amarone not discovery by Alcoholic KOH Resin —

[illegible]

Cocaine [illegible] Trichloroethylene [illegible]
Insoluble [illegible] 100 C not attacked by
Cooking KOH —

Chinosol unaffected KOH, [illegible]
Cooking. 152 C

Nitranisol [illegible]
[illegible] — [illegible] 760 [illegible] [illegible] H_2O
Not affected by Cooking KOH.

Chrysoidine [illegible] MP [illegible] unaffected KOH

Benzilim not affected by Cooking KOH
MP 130 C [illegible]

Benzoin - MP 120 C Cooking KOH [illegible] attack

Benzophenone MP 248 C not affected
KOH —

Benzostilbin, MP 244 — boiling KOH
of 12 without decomp —

Betulin a resin from outer bark of
Birch tree MP 200 C not changed
by KOH —

Hydroxylate of Cinnamone [illegible]
$C_{15}H_{12}O_2$ not affected by boiling KOH —

Cinnamone [illegible] MPoint 200 C.
loses H_2O on KOH,

Cinnamic Aldehyde heated
with 50% KOH from [illegible]
Ca Liquid SG 0.81 BP 171. C.

Cumarin, got by mixing 1 pt Sugar with
15 to 30 pts. dichloroacetic + evap to dry
& heating for few minutes to 120 C.
is not affected with KOH,
Some resinlike takes place with
other Carbon hydrates such as
Glucose Cellulose Dextrin —

Cumene C_9H_{12} BP 144°C. aromatic.
SG 0.87 – not attacked by fused KOH –

Cumene salicylous anhydride (see Cumenic anhyd) not attacked fused KOH

Cumarethane not attkd KOH MP 190°C
colourless crystals sub –

Cymene oil. SP 0.87 BP 175°C
Aromatic, not attk KOH

Dammara Resin – not attkd by KOH
except acid part – quod –

Ethylenic Oxide with Aldehyde
Not attkd KOH. SP – 1.0002 at 0°C
BP 82 –

Guaiacine SP. 0.187 BP 118 C
not affected by KOH –

Helenin. – solid insol H_2O MP. 72 BP about
275 not affected KOH in water or alcohol

Helenene a hydrocarbon liquid. Insol water
BP 275.

Heptyl Chloride. SG. 0.89 – BP 160 C
aromatic unaffected by Boiling KOH,
26.6% Chlorine not, burns smoky green
bordered flame –

Hexylene Chloride, Dichlorhexane Water
Aromatic BP 191 C 42% Cl.
Boiled for some time in alcoholic KOH
decomposed with HCl + another Chlorinated C

Hydrobenzoin. solid – not affected Boiling
KOH, Dilute alcoholic –

Hydrocinnamide – solid not affected by boiling alcoholic KOH –

Ichi Resin – one resin ingredient not soluble in KOH –

Indigo blue natural KOH –

Iodoform not sol. CH_2O in alkali or acids – decomposed by boiling KOH

Note = Thank Mr. Wm. Gunter of Brown with plenty of Graphite would do as a practical demonstration for Lecture

Marrubiin not affected by KOH

Melene – paraffin wax not affected boiling KOH

Mesitylene —
BP 155° aromatic – light oil –
Not decomp by KOH aq –

Trichloromesitylene solid not decomp
even by Resorcinol & KOH –

Mesitylene dilo –

Chloronaphthalene not attkd KOH
oil – get spec g

Dibromonaphthalene MP 59 not
attk) KOH

Hexachloronaphthalene Wax
MP 140 C Cambe bent
Rosette Crystals Unattacked by KOH

Octyl alcohol BP 180 - SG 0.82
Insol H_2O
Chloride insol H_2O, hydrolyses slowly H_2O
Sp grav 0.89 burns smoky green flame - Unsat unaffected KOH, both aromatic -

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Morcrin - solid insol alcohol KOH, insol H_2O -

Oxynaphthylamine - amorp powder
Insol NH3 or KOH, insol H_2O
$C_{10}H_9NO$ — dis oxidized Naphthylamine — poisonously bitterly - it combines with Neither acid or alkali

Palmitone, Ketone of Palmitic a - MP 84
insol alcohol KOH

Anthracene unaffected by alkalis

Oxanthracene solid m.pt. not affected by NaOH [illegible] –

Phenol not affected by KOH BP 187 floats on water sp. gravity [illegible] 0.8 [illegible] dissolved not [illegible] probably through [illegible]

Ethylic phenate, (Phenetol) – BP 172 aromatic, not affected by KOH.

Bromophenol MP 164 – not affd. by alcohol for KOH. [illegible]

Monobromobenzene not affd. [illegible]

Chloride of Phenyl - BP 138 C
not affected KOH -

Phenyl Sulphide prepd -
BP 292.2 C aromatic insol H_2O
not affected boiling KOH water of
crystallisation - Spec g 1.09

Tribromophenylamine
Crystl MP 117 BP 304 insol H_2O
Sol alcohol AgN
KOH hydrolysis at boiling heat.

Cyanaline - Crist. MP 210
Neutral insol H_2O not affected
by boiling dil KOH -

Mononitrophenylamine
action of Bromine water Resin
not affected by KOH -

See all the Anilines yes, with KOH —
to get the bases they are good for,
indigo for separators, also bring the as
bases into Bromic acids for phenol —

Pyrotartrimide its solution from
with Ether hand a very alkaline
solution, dries to varnish —
The solution attacks paper
rendering it viscous regelatinous. S.

Pyrrol BP 133 — finely aromatic,
insol KOH — it, decidedly basic —

Pyrrol Red a solid insol KOH
or acids —

Quinoidine, a base got in mfg
quinine, Resin, insol KOH —

Styrylamine — a base solid
insol KOH melts by yellow
oil Volat at 100 —

Phenylsuccinimide —
Cryst - subl — 60. KOH aq no action

Saccharin — not sol KOH,
Cryst MP 128 —

Thymol — cryst - insoluble
MP 45 — insol KOH —

Chlorotoluene BP 157
sp g 1.050 at 14 C S —
Not affected by KOH —

Acenaphthene not attk KOH,
MP 100 - boils 274 — solid,

Methylacetal, not attk KOH,
SG 0.85 boils 55 C S sol H_2O —

(Phosphomolybdic acid is a delicate test for KOH, 1 pt to 500, gives yellow sol precip – Na no precip – Can this be utilized in testing –)

Anthrachrysin black mass insol in KOH, alcohol ether H_2O or NH_4Y –

Hydranisoin Salol MP 172 not attk [illegible] or [illegible] KOH –

Anthracene Hydride MP 106 – Not attk KOH –

Dibromoanthracene Compt MP 221 C Not attk and by KOH or Alcoholic KOH. Decompt at 160 C

Dichloroanthracene MP 205 C Not attk KOH sol

Little Tetrachloroanthracene MP 220

Anthraquinone MP 273 not only by strong oxidizers not attk by Alcoholic KOH or even fusion with KOH

Nitro-Chlorbenzene Fritzsche
Reagent - Coal — with no alcohol
Hydrocarbons —

Hexachlorobenzene MP 226 BP 331
difficultly
alkali by Potash —

Monoiodobenzene - Beyond aromatic
boils 185 SG 1.84 —
not decomp by solid Potash or
alcoholic KOH or KOH Hydrate

Sulphobenzide solid (naphthalene)
Alcoholic KOH - warm at 180 in sealed tube
MP 125 C

Dichlorosulphosanilide. oil. heavier than H_2O insol. H_2O faint odour, like Camphor Distls. 300° not affected by alcoholic KOH or H_2SO_4 –

Toluene in alkaline Pot. permanganate gives Benzoic acid & neutral salts & chromate by insol. H_2O & alkali

Dibromotoluene MP 107. not attkd alcohol KOH – or oxyd by $BiCrO_4$ SO4

Sulphotoluide MP 155 insol. H_2O not attkd alcoholic KOH –

Tolyl Bromphide not attkd KOH

Dibromoxylene. MP 69 unattkd alcoholic KOH

Monobromocamphor, BP 218 SG 1.32
not alkali alcoholic KOH)

Monobromocresol tyfano -
oil aromatic SG 1.31 at 10 C
BP 225° not alkali KOH and only at very Temp

Bismuth aromatic hard red resin
dissolves Ether 15 100 C — scales like
dissolves forming 2 layers one of
which is a compound of Bi Br3 & Ether
Bin Compound decomposes ??
Pt Sup 347 —

Brominated Camphor, Monobromo C
aromatic - Solid MP 76 - not
decomp by alcoholic KOH.

Camphor heated for 3 or 4 hours
with alcoholic KOH is converted
into a soft tough yellow resin
which is insoluble in water
by prolonged heating to 100 C

Monobromoacetic Lighter than water not soluble KOH –

Condition – by boiling dilute acids Resin formed usual KOH test 1st Sup 459

Bromacetyl Chloride in Ether
Bromacetyl – nearly insoluble –
BP 245 SG 0.9735

Ethoxyl-acetamide – usual KOH – 1st Sup 585

Note Sodium Ethylate White amorphous infusible very hygr. sub Phenol in Ether
Indol in ether turns Brown air
Phenol? –

[illegible] Methylchloride [illegible] in
Dichlorophenol Ethyl Oxide —
Liquid BP 157 — Jaromatic
heavier than H_2O not attacked by
Boiling KOH aq — No
Methylchloroformate & Ethyl Oxide
1st Sept. 1897 —

Diethylene bisulphide, [illegible] SO_2
MP 111° Sulfur at 56 — BP 200,
has strong rat nauseant odor
that attacked by alcoholic KOH —

Glycoliquose a substance remaining
after extracting the wood of the spruce
fir (Abies Pectina DeCy Pinus Abies L.)
with dilute acetic acid. Weak [illegible] Glucose
its yellowish white mass in all liquids
possibly not affected by KOH —

Grahamite, pitchy fossil or mineral
found in Ritchie & Virginia
Insol KOH or alcohol partially
in Benzol & Chloroform CS + Benzol
Soften 200 76 C 7 H 13 O, 13 ash

Guanidine, 1st Supp. 674 See Melamine
Insol used in alcohol

Same – paraffin MP 56 Cent boiled
3 or 4 days with Sul acid + K Bichrom
to which a little Mang Dio is added
in Connected with Cerotic acid
Melting 78 Cent? — in the Compds
Same paraffin heated with 5 or 6
Vols Nitric dilutted with 1½
Vols water yields, instead of fatty
acids melting after purification
76 Cent.

Lumacoid 1st Sup water - anhydride of Lanolin A - perhaps [illegible]
Cholesterol -

Tetrabromonaphthalene Crystl
not affected by alcoholic KOH -

Tetrachloronaphthalene -

Cyanonaphthalene 1st Sup - 547
B Cyanide - Lamina and like Stearine
MP 65 - [illegible] white mass
Phenol -

Dibromonaphthol - MP 215 - Crystl
not affd KOH, 1st Sup 855

Tetrachlorohydroquinone - 1st Sup 988
[illegible]
Diethyl-tetrachlorohydroquinone
MP 112 - not affected by KOH Lye
also Diacetyl -1

Sup 994 [illegible] brick red powder
Not dissolved by KOH aq — or ethyl by Chromic A
Sol Benzol —

Wells 1st Sup 1014
Sa [illegible] 9/10 [illegible] as it passes over
in the 1st distillation bet 230 & 238 C
Consists of Safrol — $C_{10}H_{10}O_2$
usual water S G 1.114 at 0 cent
[illegible] liquid at —20 cent.
Converted by Alcoholic potash at
180 To a black [illegible] Resin
by action at 120 C
Safrol is converted by
[illegible] to a
Black [illegible] mass of Metacellonsafrol
Same thing produced by 1 pt Safrol
+ 1 pt Bromine —

Methyl Potash will act on Safrol with
difficulty —

Reminders Lines conducting more
Conducting Sulphides together
+ Cast —

Wells 1st Sup 1090 Ethyl-Phthymal
aromatic liquid insol H_2O boils 222
OX chloroform KOH dont attack
even when heated —

1st Sup 1106 — Diethyl-trichloroketohydroquinone
MP 177 dissolves in H_2O not
attacked soda lye even heated —

Benzamide 2nd Sup 50
MP 192 Crystal insol H_2O not
affected by KOH —

Anthracene Orange 2nd Sup 86
MP 225 ? Sublimes
KOH have no action, HCl no action

Anthrachrysone. 2nd Sup 86 –
Green prisms. Does not melt even at 320 Cent
Can be distilled unaltered decomp.
H_2O only dissolves traces – best solvent
Glacial acetic acid & other solvents. Insp –
Not affected by Sodium Amalgam –
Magnesium Salt canary yel ppt insp –
Barium Salt dark Crystals.
by fusing Anthrachrysone in ICK KOH
(large quantity) brown like substance formed.
Separation –

Diacetyl-chloranilinoanthrahydroquinone
2nd Sup 94 m.p. 202 not oxidized by SO_4H_2 CrO_3
Not affected by heating in KOH Spec g 1.3
but is by higher Conc

2nd Sup Azodiacetyl Blue
Dark purple needles from Conc alc. alcohol
Sol Ether insol H_2O –

Sup 140 - Monochloro-benzene.
Spec. g 1.12 at 0°. boils 131.
Not acted KOH, or K alone at and temp -

- Trichloro-benzene Crystl MP 17
boils 206 - strongly bitter. not impl. form. with alone. Spec. g 1.457
not acted by KOH in any form even by heat,

Dibromo-benzene MP 205 Not acted KOH - 2nd Sup 148 - Sol Chloroform.
Boiling Benzene 1 CS -

Ditto Tetra-bromo-benzene MP 320° - minutes heating to blacken ?

2nd Sup 159 - Benzyl tetrachloride, not acted on by boiling KOH, MP 153,

(2nd Sup 164 - Benzyl-tone - Diacetonide.
Crystl. Decomp. at 200 Slightly Sol H_2O
Not affected by KOH, Conc. or Dil. Hy -

Ind Sup 254 — Cantharidin

Sublimes, insol H_2O MP 238° boils 338 — not decomp by passing thru red hot tube, not decomp by prolonged fusion with KOH hydrate or heating to 200 in alcoholic KOH,

Ind Sup 316 — Chlorohydrins —

Dichlorhydrine heated with alcoholic ammonia yields KCl & Chlorohydrinamide

White crump insol H_2O Ether or Conc acids, not affected on boiling SO_4 Aqua Regia or strong KOH — on hot ignition & swells up enormously yields a perfectly transparent gelly

Ind 420 Bromocyanine — not affected by KOH,

Sup 61 — Cornel indigo purified on KOH lye dissolves out general impurities & leaves pure indigo behind

Contains acid groups, shaved with HCl leaves only 3½% — Cathcart

Boiling = 2nd Sup 637 = 636 –
[illegible] fractionate to 140 C
deposits some ferric oxide –

Smell of Naphthenic acid to Lubricating
oil – collected by by boiling in
glycerol [illegible]
brown [illegible]

2nd 891 – Nitrogen volume basic, ~~[illegible]~~
Cryst not sol in KOH –

2nd 891 – BP paraffin Butane 1
Pentane 38
Hexane 70
Heptane 99
Octane 124
Dodecane 202
Hexadecane 278

2nd Sup 140 - Acetophenone a basic
MP 130 not dis by aid but Sodium
ion and by Chromic a -

In Equally with Hydrolysis cross fritsch
Reagent to cross Phenol a to form
Stable Chlor derivs by KOH or Alky.

2nd 1125 Sulphotoluide
MP 155 Not alkd by alcoholic
KOH at 160,

2nd Sup 3 - Acetanilide - Chloride
with heat, gives Hydrochloride of
base which precipt by KOH
to amorp base

2nd Sup 138 Azophenin not alkd KOH
MP 224

3rd Sup Dinitrometatolubromobenzene
Not with KOH – M.P. 157

3rd Sup 209 Diphenylphthalidoxamine
M.P. [illegible] unchanged by acids
or alkalies

3rd 211 – See Sulphur in Dyes –
Probably that [illegible] other bases
precipitated by KOH – not soluble and
can be further changed by
treating with sulphur to
use for separation –

3rd 214 Nitrosoresorcyphenazoxonine
yellow oil – heavier than benzene
that volatile alone or with
vapor of water
& is quite insoluble in alkalies
probably it will sink in 20% KOH

[illegible] possibly [illegible] with [illegible]
[illegible] 12 [illegible]
xt. [illegible] must be
possibly [illegible]
[illegible] jellify — KOH.
[illegible] seems rather

[illegible] or [illegible]
[illegible] on aq KOH or alcoholic KOH
[illegible] pl —
3rd Sup p 555

[illegible]
[illegible] KOH — 3rd [illegible]

[illegible]
[illegible] alcoholic KOH
3rd 653

Nitromethane [illegible] / n. [illegible]
[illegible] KOH -
3P 672

[illegible] - used KOH Hormone all other
solvents [illegible] - 3P 677

Echinacoside - Elastic sub
[illegible] KOH - 3P 679

[illegible] Nitro - [illegible] Paraquinone
that filled by [illegible]
to 500 [illegible] - 3P 691

Nitrolyl-Methane [illegible] acetaldehyde
by Johnson - Formaldehyde
3P 298 C. 15

[illegible] - Cannot [illegible] [illegible]
be made [illegible] by Company
[illegible]
[illegible]
[illegible]

A very viscous sublimate at ord temp or above MP will dissolve lots of crystalline stuff from solid [illegible]
Unfortunately will ferment [illegible]
Thus no good for plant [illegible] glass [illegible]
Thus natural

Beer glass – 5.75 CaO 5 N_2O 18.6
Why of silica carefully [illegible] by bases as above were it dissolves in NaOH, possibly Silicate Soda with [illegible] of Mg. mixed as Gender & fused were [illegible] sepatelus –

Seal NaOH for 24 hours in 20% NaOH or 2[illegible] [illegible] glycerine

[illegible] Calcite [illegible] [illegible] seed [illegible]

Bird [illegible] wing by KHCl [illegible] & Water to [illegible] & [illegible] [illegible] KCl [illegible] by Hydrogen –

Isolepidin – 3rd Sup 1176
Not affected by alcoholic KOH,
becomes insoluble on prolonged boiling
ditto Oxyisolepidin –

Nitromanitan 3rd Sup 1267
by boiling with alcoholic KOH makes it a
black gummy non explosive
mass ?

Bromodimethylaniline 3rd 1308
Not affected by boiling Sodalye –
its usual in alcoholic KOH – b.pt 255
BP 247 – its a base –

Iododimethylaniline
a base – acts same as above.

Nitrosodimethylaniline
a base – insoluble KOH, p 1309
3rd Sup – MP 92 – slightly soluble
in a concentrated solution –

Dimethylaniline – phthalein –
Base – nat sal KOH nat alkd of 200
by KOH – 3rd 1310

See Rubidium product also a base

Nitroso naphthol,
3rd 1363 – α Nitroso-α naphthol
B Nitroso α Naphthol – Goth
[illegible] KOH –

1475 Methyloxysulphobenzide
Nat Sal KOH, MP 130 –
1475 Dinitromethyloxysulphobenzide
Crystl [illegible] KOH –

1514 – tri Bromo-m-xylenes
nat alkd by KOH alcoholic a

3rd 1515 High chlorinated m-xylenes
nat alkd by alcoholic KOH –

3rd 1570 Phlorobromin –
MP 152 – decomp at higher temp
insol H_2O not affected by boiling KOH,
boiling HCl or Na amalgam –

Pyrroline, 3rd 1728 – methyl, ethyl
derivs (pyrrolines) legumes BP
113 131 180 not affected by
KOH – legumes.

3rd 1994 Dinitrotoluene ~~Fused~~
Sodium amalgam gives black
unmanageable ulmin –

3rd 2032 Orthodicetylidigin
not affected Sodium Hg
MP 55 – Valerolactone ~~[illegible]~~
readily with water vapor

Tribenzoylene-Benzine 3rd 2041
Dont melt at 450 — not attacked
boiling Potash lye — or Bromine,

Vascoline a variety of Cellulose
not attacked by KOH except at 200
under pressure — Resinols of cresols
Contains 50% of it —

(Very elements of the amines, & have in
it — also Chemical Resinates —
the Ethylene ammonia bases are poly good —

Hydroxyacetal, anomalous liq BP 167
Ethanol amide — Rowdahl 69 Vol III Az

(Aldehyde ammonias in alcoholic Sol
shrinks on standing quickly on heating
giving amorphous Gases Cracked
Aldine bases — for phono

Bases — or Neutral

Thialdine — $C_6H_{13}NS_2$
p. 498 - Rotsch Monacid base

Glycocyamidine, or Glycolyl-Guanidine-base RTS. No 516 -

Creatine (neutral)

Creatinine, base -

Glyoxalin base

Oxamide (perfect neutral) white powder

Chloroxalethyline Base RTS No 533
only BP 217 | Narcotic smell - Tertiary base

Oxalethyline - Narcotic smell BP 212
Tertiary base

Propylene Oxide + all the hydrocarbon Oxides
Bases

Propylene-Diamine, Grace,

Note Ethyl Nickel acetacetate
Sol in Hot Benzene ? ? RTS 550
possibly some organic sol. of Ni can be
obs in Chloroform Benzene etc or
precipitated by 81 quinolo alkali to get
a sensitive oxide not hydroxide & —
formate, acetate etc —

Succinate of Ni is sol in Water,
only alkali + Mn & Mg salts are sol —
There is a strange for Ni —

B-Cyanopropionic acid - by heating
heating to boil with alkaline sol
of permanganate K, amorp yellow
white sediment 100 at 140 Grams
only Sol sol H_2O & alcohol
from Amorphous Salts, usually
red brown, not crystalline
RTS 592

Heptapropylene $C_{19}H_{36}$ boils bet 390 + 400 C.

Theobromine – Base
Caffeine "
Methyl-guanamine "
Alloxalidines — Bases.

Monacetic-Saccharose action acetic anhy + acetic glacial on Cane sugar – amorphous compound 834 – Rot δ – see

Cold H_2SO_4 act. on starch flour second acid sulphate formed these yield amorph sacts –

Gun Cotton is useful in lab for filtering gelatinous ppts & other highly oxydizing liquids –

~~From Cellulose Solution of Cellulose Nitrate~~
~~Treated by Potash Lye~~

(Cellulose Dinitrate dissolved in Caustic Potash Lye decomposes to a brown gummy mass —

Furfurin — base

The Sulphonic acids can be heated strongly without decomposition not attacked by boiling Caustic alkalies & only oxidized by Nitric acid with difficulty

Methylamine base
Di "
Tri "
Tetramethylammonium " Base

(Still Chloroform sunk in 20% KOH
at this o.p.c of 1.52 —
book 61 C

Tetranitromethane, $C(NO_2)_4$
Colorless mobile liquid
Crystalizes at 13° boils 126
Neither Explosive or inflammable
Thus poss good for Bathing

Ethylamines – Bases

Ethylhydrazine – base
Destroys Cork & also Rubber

Tetraethyl-tetrazone – base

Triethyl-phosphine – Explosive
Stable body not affected by
or KOH MP 44 BP 240

Triacetamide, perfectly neutral

propylamine base

Propyl pseudonitrol
solid. insol water acids or alkali

Isopropyl phosphinic acid
Salt paraffine lake III also
No 364 R+S MP 60 to 70 C

~~Trimethylcarbyl nitrite~~
~~Oil BP~~

Tertiary Nitrobutane, aromatic
peppermint smelling liquid
BP 110 to 130 neutral but acts
Br or KOH $(CH_3)_3 C.NO_2$ —

Butylnitrous Base

Hexachlorobenzene MP 226
insol H_2O not acted KOH
or boiling Conc acids —

Aniline bases
Chlorinated aniline Bases —

Metanitraniline not alkali
boiling KOH MP 114 - sulphate
Goods 285

Aminodiphenylamine Base in
Tropaeolin OO of Commercial —

Sulphones have neither acid
or basic qualities —

Mauveine - base of aniline dyes
Mauve - powerful base

1891 R.S.
Safranine - an aniline dye
powerful base in it
unaffected by KOH.
Sometimes called Toluidofranine
The base is a hydroxyl base possibly
work in place Ni hydroxide

The salts of Safranine not decomp. by KOH —

Experiments to make altitropic change in $Ni(OH)_2$ to get rid of swell —
Boil $Ni(OH_2)$ free of basic salts in olving solutions of following for 24 to 48 hours.

Chloride Zinc	Chloride Calcium
" Aluminum	" Barium
" Sodium	" Strontia
" Magnesium	" Lithia
" Cadmium	" Iron
" Copper cerium	" Ammonia

Ammonium Hydroxide

Sulphate Iron	Sulphate Copper
Potash	" Magnesia
Zinc	" Cerium
Magnesia	
Cadmium	
Ammonia	
Lithia	
Aluminum	

Acetate. Iron	Cerium
Aluminum	
Magnesia	
Zinc	
Potash	
Ammonia —	

Borax - Thios Soda, Glycamic
Sugar - Pyrogallate Potash -
Formaldehyde - Acetic Aldehyde -
Hydrazine -
Naphthalamine, + other amines
Ammonia - Alcohol,
Brominated Hydrocarbons -
Chloroformol "
Hydrochenon
Amidobenzol.
Sulphites -
Iodide Potash, Iodide Ammonia
Iodide Zinc, / Magnesium,
Bromide Ammonia, Zinc Mg K

Nitrate Ammonia
" Iron
" Copper
" Nickel
" Copper
" Magnesia
" Manganese
" Alumina
" Potash

Nitrate Zinc
" Tin
" Cadmium.

Those that show try in sealed tubes to get higher pressures –

Boil Nickel from oxalate reduced by Hydrogen in boiling solution of the described salts to see if a trust oxide can be formed –

Boil $Ni(OH)_2$ in 35% KOH 48 hours

Act on dry Ni acetate, formate etc with oxidizing agents –

act on Ni by H with gaseous oxidizers water free –

Make organic acid Ni compounds & act in non water solutions & oxidize & precipitate –

Precip $Ni(OH)_2$ from Cyanide acetate formate nitrate & organic acid salts by KOH cold & hot strongly salinated with Reducing agts – boiling hot Ni Salt Solution as well

On theory that $BiOH$ is reduced to metal by reversing & that it is not oxid'd till MnO_2 is ade formed & acts as conductor —

Precip 20% following with $MnOH_2$ & Mix with graphite dry way & put it on reversed — Other Chge Copper, Silver, Bismuth, antimony tin Cobalt, & also NaOH. Sub as Sb wire with dry — Mn —

Leclanché — Mix 6 + 4 - black oxide made by Hypo - consolidate + try in Leclanché with Zinc —

Make lot of the white MO by heating $MnOH_2$ in Melted Sl KOH, — then 6 + 4 & Reverse & try various effects — also try oxidize it to Mn_2O_3 by gaseous oxidizer etc Its got it active again

Make some anhydrous Ni_2O_3 from
ignited nitrate or granulated
then reduce & try various reducers
under various conditions, + try 644
+ various atmos to reoxidize —
also - mix with the Ni - Not Cu Bi Ag/Sb. Sn Etc
20% —
Make some Ni_2O_3 by electrolysis
of salts, Acetate H_2 in water of
strike & get enough to make grid
842 see swell —

Try $Ni(OH)_2$ in Aldehyde Formaldehyde
etc other non conducting liquids
in sealed tubes & keep high temp
for many hours —

Make grids of wool Ni Compounds
Oxalate, Phosphate Borate Tungstate
Urenate, Molybdate, Organic acid
wool compounds - put in water
solution with trace of an acid.
+ Reverse + decompose warm
Zinc to absorb acid + make wool
Compounds there when reduced
Take out thoroughly wash + wicky
Not

For separators - make mix of Oxdzd Graphite + a mucilage (linen) Gums Tragacanth etc + prelimmerize in fil furnace to a point where plastic + not altered by KOH boiling - use Mg $BaCO_3$ Oxalate Lime - Carb Sr etc -

Get from Standard Oil Co Residum nearly to Coke -

Get some large bast fibers big enough to make a Separator when shaped + prelimmerized in furnace

Get the lowest BP paraffine oil + test in battery for cooling + stop foaming -

Try fusing MnO_2 in melted KNO_3
$NaSO_3$ + other possible salts
as per Kennelly's tables - also
in salts which react in water
of Crystalization —

Make 3 + 3 Ni by hydrogen
well reduced + oxdize by 20% KOH
then if it will not try 19 + 1 Radical
+ keep on diminishing KOH +
adding Radicals - until
on transfer revealing it
shows sensitiveness,

Also Ni by Hydrogen with
20% Mercury oxide - Reverse
& then Oxidize with +
weakest Radicals —

Heat formate Ni in sealed
tube to decompose it - use
distilled water - possibly
some Zinc in top tube also

or bent tube + distil over + absorb by solid KOH in other bend of tube —
Possibly dry formate crystals in glycerine. $ZnCl_2$ $MgCl_2$ — Castor oil ~~CaCl~~ — Paraffine oil etc with bent tube + KOH work ok —

Precip $Ni(OH)_2$ with 15% BiOH + 4% HgO — + reversed — to make $BiCl_3$ + amalgamated —

ditto 15% CuO + 4% HgO — boil w/ excess KOH — Reverse to make Cu Conducting + amalgam

Leclanche — fuse together with KOH, Manganous oxide — then charge by current to per of Man + use in Leclanche.
ditto add 1/2 graphite 1/2 Manganese ox + KOH, bake together charge to Per ox Mn by Ct + chemically + try in Leclanche

Possibly 1/2 Manganous Oxide & 1/2 Cupric Ox with KOH binder a change with Current be good for Chlorides -

Possibly 1/2 Cu 1/2 Manganous Nitrate precip together & boiled with KOH & put in big lump Cup be fine after changing -

Possibly above with 2/3 Cu 1/3 Manganese would keep valls up MnO_2 acting the Catalizer to keep Cu from going to Cu_2O transferring O_2

$Fe_2(OH)_3$ possibly by precipt $Bi(OH)_3$ 20% or $Ni(OH)_2$ and also Catalizer - $CoOH$ etc with ferric hydroxide might get an Endothermic Sub as good as Ni - try 6+4 mix with various Umpf precipt

As ozone is a gaseous energetic
Oxidizer rig up apparatus
+use it in Nickel Experiments
for stands with H_2O_2 + H etc —
+ dehydrate $Ni(OH)_2$ by fused KOH, etc —

It might be good idea to make
tertiary precips with Ni

Ni OH. + 15% B. OH 5% Cu
" 15 " 10% "
15 " 15 "

+ other metals also Cu + Hg
Bi + Hg + so on —
also Stannic precips fused with
elate KOH to see if reoxidized
Cant be got anhydrous —

Heat nitrate Ni in sealed tube
absorb NO by KOH if that OK
also heat nit. glycerine — dilute
$CaCl_2$ —

Perhaps in a neg grid, Worth NiOH there could be dissolved in the KOH, a compound that would cause NiOH to become Sulfide to a Certain Extent & this not reducible would act as a Conductor or the NiOH be regular Impure SO_2 or be immersed in a Solution giving Yellow NiS –

Perhaps Ni by H. but in sealed tube with wires & filled with Dry O. well form ozone & oxidize Ni so it will be sensitive,

Perhaps a whole Battery grid Can be put in a Nickel Plating Solution & plated over 1/2 of it & then washed & be Nickel solid so Cant Expand Cups open

Make a plate of $Ni(OH)_2$ mush with say Zinc dust add to a mush when nearly dry press it & then reduce by H_2 & put in KOH & Eat out Zinc. Thus we will have a spongy plate say 1/4" thick Make Concentrated Solutions of Ni Sulfate & precip in porous wash dry & add more & make another precipitation until fairly full then press in Cups for alone in a grid till 100/100 May be soaking the —

Possibly with a strip, or in some way Ni_2O_3 can be formed Electrolytic from acetate or other proper Salt — when used in Cup it may be more dense & not swell so much — Electrolytic peroxides are more dense & crystalline — as there will only be formed a thin layer on next of lack of Conductivity a travelling strip may be best with scraping it off —

Possibly a sheet of Ni could be peroxided thin .002 or .003 of Ni_2O_3 washed + then plumbagoed + a new layer plated on

Possibly big flake graphite coved be plated thickly with coherent layer of Ni_2O_3 electrolytically + used in a grid after leaching — there wld be no basic shell formed - its only a question of getting proper salt + sodium chloride etc to get coherent deposit — This is good Expmt. might have to mix some xlne graphite to join

There is one thing in the favor all electrolytic peroxides are much more active than when made chemically

Separation – I notice that sulphate nickel + sugar evap to dryness the bottom film about 1/64 film collects + this is coherent & flexible – its probably Oxidation by reduction + solvent Carbonization of the sugar possibly some sulphur – its not affected by boiling water or ~~[illegible]~~ boiling 20% KOH = possibly a phosphor Mn – ferric nitrate etc or little nitrate of Mag Mn NH etc mixed with sugar + evap down to nearly solid + then used as binder warmed on higher heat make flexible sheet ~~[illegible]~~ etc there something in it – Sugar is changed

This idea of using Oxides which are hydrophobic is good as there are many things the sheet can be formed up such as asphalt that on heating will reduce Oxide

possibly solid powdered Disulphide Could be used mixed with the Organic material & on heating be reduced to metal & effect the Change in the organic to make it metal in KOH etc —

Phono -

As it is easy to record perfectly when not loud & especially with 20/1000 & as we can make metallic records - We might be able to amplify & make machines Mechanically

But - Probably sheet Ni 1/4 thousandth Could be plated & stripped from Aluminum plates & then performated & plated with Ni_2O_3 Electrolytically for or Even 1 inch or 1½ Could be bounded to yellow to form Reg gra —

Cassa.

Try mixing fine graphite with Nitrate Nickel so there will be 6 of graphite to 4 of Ni_2O_3 after ignition. Then powder up & put in grid - possibly Can be got so white to outdo best of chin reduced by sugar or formaldehyde or H_2O_2 & put in grid —

As the higher the temp the less H_2O of Crystallization is there in salts then perhaps $Ni(OH)_2$ precipt'd under pressure would be less colloid as the pressure was greater. Can be tried in sealed tubes the sulphate or other salt on one side & NaOH on other & whole heated to say 400 deg Fahr & tipped to below NaOH run into Ni solution

Is Hypochlorite Magnesia good in alkali if not it will work as deleaded with graphite —

Chlorite lead used water - possibly lead battery with chlorous acid also as chloric acid dont decomp Carbonates, Chlorite lead might be used in Na_2CO_3 or even KOH -

As Co_2O_3 from expelling nitrate never tried try it with 1/2 fume graphite to 1/2 of Co_2O_3 powder & put in cup possibly may be active,

A nickel salt to which is added some Sodium specolate, or than Hypo K + Gold deposits the Ni_2O_3 in a specular state make Enough for a grid & test vessel -

Lelands – Zinc & large quantity of Che Mg – a graphite + phox
Many like and make Ni OH + Mg
Ranges upon Consistent heavy
Current, also in KOH,

Uranous hydrate by boiling with H_2O
Greens black & anhydrous
Try NiOH + UOH precip by cyschem
to metallic like & works enlarged
supposed to be the metal –
UO. in formula

Make a Cell of good metal
of Fe with Hydrogen & test
Economy –

It is understood and agreed that no part of the profits shall be used as fixed capital but shall only be used to repay the holders of ordinary shares, for interest thereon and dividends thereon on the ordinary & deferred shares ~~as above provided~~ as herein provided,

In the event that ~~the profits of the Co~~ are greater than the Co requires more fixed Capital for increasing the Capacity of factories, ~~the [illegible] of the Co be~~ [illegible] ordinary shares ~~to the amount of capital used~~ ~~debentures bonds~~ that the ~~[illegible]~~ [illegible] shall be done from accumulated profits, by the declaration of dividend ~~to both the ordinary & deferred shares in the proportion of 7/10 to the deferred & 3/10 to the ordinary & the same shall be~~ by an issue of ordinary shares in the proportion of 7/10 to the deferred ~~&~~ 3/10 to the ordinary shares to represent the profits so invested

In event of liquidation the ordinary shares outstanding shall be paid at par and the balance of any assets be divided in the proportion of 7/10 to the deferred & 3/10 to the ordinary

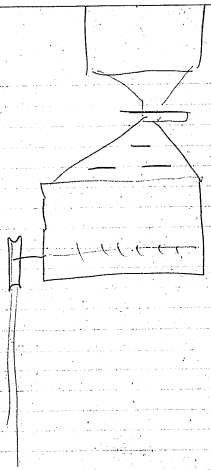
In the event of liquidation the ordinary shares shall have their principal repaid and any further sum available shall be divided in the proportion of 7/10 to the deferred & 3/10 to the ordinary

After the principal has been repaid to the holders of the ordinary shares, The clause relating to the voting power shall be amended to read that the voting power of a share of preferred or ordinary shall be equal.

The Co shall not knowingly sell bottles ~~Cocoa [illegible]~~ for Export ~~[illegible]~~ to foreign Countries

Proposed Co (forming) to supersede the Company holding
Common Stock & the holders of Preferred —

The Co shall ~~possess~~ or may absolutely, purchase
any other Co or grant the same rights
to others, or in any way ~~[illegible]~~
~~[illegible]~~ use its capital for any other
purpose than the safe keeping & [illegible] storage,
including ~~[illegible]~~ the Consent of ~~two thirds~~
holders of the ~~[illegible]~~ deferred stock —



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6%

Issues 750.000 dollars [illegible] shares
Issue 885.000 " of [illegible] dollars
Capital 1.25 [illegible]
Leaving 110 - 750.000 dollars
at from sales of land shares received.
Leaving 110 [illegible] on hand.

1,250,000 stock
750 000 Deb –
250 000 of deb sold for cash at
500 000 " par Co –

1250 000 Stock we also get +
turn over to Deb people 375 000
of stock – which is

1 250 000
375 000
875 000 Stock Company to us

We get 875 000 stk
" 250 000 Cash

But of 875 000 we give
Cash 125 000 – leave
875 000
125 000
750 000

175 000
150 000
25
175 000
150 000

150

6 – 4

40

25 000

175
25
200
150

175 000
25 000
150 000
150 000

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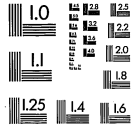

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